

**From:** Jason Peltier  
**Sent:** Friday, January 6, 2012 7:18 AM  
**To:** Craig Manson; David Bernhardt; Daniel O'Hanlon; Jon Rubin  
**Subject:** more fun with animals

## Marine biologist charged with feeding whales

[Henry K. Lee, Chronicle Staff Writer](#)

San Francisco Chronicle January 6, 2012 04:00 AM [Copyright San Francisco Chronicle. All rights reserved. This material may not be published, broadcast, rewritten or redistributed.](#)

Friday, January 6, 2012

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Chad Ziemendorf / The Chronicle

Nancy Black, a noted Monterey Bay marine biologist, steers her whale-watching boat, Sea Wolf II in 2010.

### IMAGES



[View All Images \(5\)](#)

A noted [Monterey](#) Bay marine biologist who operates a whale-watching business has been indicted by a federal grand jury on charges she illegally fed killer whales in protected waters and lied to investigators.

The case pits Nancy Black, 49, whose research has been featured on National Geographic and the Discovery Channel, against government officials enforcing the Marine Mammal Protection Act, which bars the feeding or attempted feeding of a marine mammal in the wild.

Black fed a killer whale in April 2004 and again in April 2005 while operating her whale-watching business, Monterey Bay Whale Watch, according to the indictment handed down Wednesday by the federal grand jury in San Jose. Monterey Bay is one of 13 federally protected national marine sanctuaries in the United States.

The indictment said Black also altered a video recording that federal investigators had demanded of an October 2005 whale-watching trip in which an endangered humpback whale may have been harassed.

The court filing did not elaborate how the video was altered or how the whale may have been harassed. But the federal act defines harassment as "any act of pursuit, torment or annoyance" that could injure a marine animal or disturb behavioral patterns, such as migration, breathing, nursing, feeding or breeding.

Black falsely told investigators with the National Oceanic and Atmospheric Administration that she had provided them with the original recording, the indictment said.

Black's company offers trips aboard its vessels, the Sea Wolf II and the Point Sur Clipper. If convicted, she can keep those boats but must forfeit a 22-foot inflatable dinghy that she uses for research and whale watching, authorities said.

Black's attorney, Lawrence Biegel, said Thursday that the indictment was unjustified and came despite more than five years of negotiations with the government.

Biegel said the marine biologist had done nothing wrong and was an "absolute paragon of virtue in this profession. She's devoted her entire life to cetacean research."

In the October 2005 incident, Biegel said, Black used an underwater camera to film the eating habits of orcas, or killer whales, that were feeding off free-floating pieces of blubber from a gray whale that had been killed by a pack of orcas. The pieces of blubber were already there naturally, Biegel said.

"The federal government says that's like feeding the bears in Yosemite," Biegel said. "You've got to be kidding me. We're not bringing in Twinkies and moving them into [cars](#); this is what they are eating."

As for the video, Biegel said Black had admitted to investigators that she edited it, "not for the purpose of hiding anything, but for purposes of picking out things she thought were irrelevant to the investigation."

Biegel said he was looking forward to having an "impartial tribunal" hear Black explain how her techniques were part of legitimate scientific activity.

"This is a classic example of the government taking a position that just may not be right," he said. "I think the government wants to make an example of Nancy and try to draw a bright line and say even scientists can't do this. I think they're wrong."

Read more: <http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2012/01/05/BA9A1MLD9A.DTL#ixzz1iggiATyn>



**From:** Jason Peltier

**Sent:** Monday, January 16, 2012 10:02 AM

**To:** T Birmingham (tbirmingham@westlandswater. org); Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLoyd Fryer; 'Martin McIntyre'; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** from the "Bay Delta Blog"

## SWRCB grandstanding on the BDCP?

Posted by [baydelta](#) · 13 January 2012 · [Leave a Comment](#)



Courtesy of DWR.

Since the package of water legislation passed in 2009, there has been a flurry of administrative activity to complete documents called for in the legislation. At least three high-profile plans concerning the Delta — the Delta Plan, BDCP, and what will be the first major update to the Bay-Delta water quality control plan (WQCP) in nearly twenty years — along with their associated CEQA documents are being prepared by different agencies at the same time rather than sequentially. Although these three plans serve different purposes, they are related and overlap in certain respects. What, then, is (or should be) the relationship among them?

A December 19, 2011 letter ([PDF](#)) from Tom Howard at the State Water Resources Control Board, addressed to Jerry Meral, does not go so far as to answer that outright, but it is still important for offering the State Board's opinion as to how its update of the WQCP “meshes” with the BDCP. [\[1\]](#)

The letter, although brief, covers a lot of ground and contains many interesting statements, one of which — lest we forgot — is the State Board's insistent reminders about its own authority:

*“While regulatory requirements imposed through the [Habitat Conservation Plan] and [Natural Community Conservation Plan] processes and other requirements or permits issued by other agencies in connection with the implementation of the BDCP will inform the State Water Board’s decision-making, the Board has an independent duty to make its own findings and it will not be bound by other agencies’ requirements or permit terms in its own decision-making.”*

The letter reminds Dr. Meral about the myriad Board approvals that will be required to implement the BDCP and, perhaps to emphasize that development of the WQCP is a distinct process that the Board is charged with carrying out to protect beneficial uses in the Delta regardless of the BDCP, also hints that there may be “other changes” to the water quality control plan beyond those executed in connection with the BDCP. Also mentioned are the expected upcoming review of Sacramento flows and Delta outflow to complement the [ongoing effort on the San Joaquin side](#). The water user community is no doubt happy to see that the State Board continues to be careful about couching the [Delta flow criteria](#) in constrained terms (noting that the flow criteria reflect the “narrow set of existing circumstances analyzed in the Report”) and implying that they represent an extreme bookend waiting to be whittled down.

The State Board, more so than any other in the long list of agencies, boards, and panels that touch Delta planning, acts as an arbiter or judge. So it is not surprising that Mr. Howard would take at least one opportunity to set the record straight about the Board’s role in disposing of petitions, including those related to the BDCP. But one cannot help but wonder whether this grandstanding will translate into any bona fide exercise of authority. The Board, under political pressure to conclude contentious and protracted disputes, has demonstrated a willingness, even preference, to import settlement agreements into plans rather than require its own staff, already stretched thin, to develop objectives independently. This tactic was the basis for [adaptive management at Vernalis](#), and also the 1995 WQCP, which incorporated the key elements of the 1994 Bay-Delta Accord. Indeed, even the closing line to this same letter invites water users and resource agencies “to bring agreements on flows and habitat improvements” to the regulatory process. So while the State Board certainly has an “independent duty,” it may be far-fetched to expect it to actually exercise that authority in a meaningful way when presented with the more expedient alternative of approving, more or less as is, the package of BDCP elements placed before it. [\[2\]](#)

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[1] There seem to be at least two versions of this letter — the December 19 version, linked to above, and an earlier draft dated December 14 ([PDF](#)). The two versions are very similar except for bits of text deleted from the December 14 version, such as the omitted reference to water right hearings that would have to be held following adoption of the updated WQCP.

[2] Contexts in which the State Board apparently prefers to exercise its independent authority include such cases of critical statewide importance as investigating potential waste of 2 to 6.05 acre-feet of seepage water, i.e., basically rounding error, in Granite Bay ([PDF](#)) and a pond lacking a permit ([PDF](#)) on the [Safari West](#) property in Sonoma County.

**From:** Bernhardt, David L.  
**Sent:** Wednesday, January 18, 2012 7:10 AM  
**To:** Jason Peltier; joe.findaro@akerman.com  
**Subject:** RE: Monday breakfast ?

Sounds good.

-----Original Message-----

From: Jason Peltier [<mailto:jpeltier@westlandswater.org>]  
Sent: Wednesday, January 18, 2012 9:05 AM  
To: joe.findaro@akerman.com; Bernhardt, David L.  
Subject: RE: Monday breakfast ?

Sure. But how about 8:30?

-----Original Message-----

From: joe.findaro@akerman.com [<mailto:joe.findaro@akerman.com>]  
Sent: Wednesday, January 18, 2012 4:08 AM  
To: dbernhardt@bhfs.com; jpeltier@westlandswater.org  
Subject: Monday breakfast ?

Want to meet at Hyatt an hour before our meeting starts on Monday ?

[www.akerman.com](http://www.akerman.com)

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**From:** Bernhardt, David L.  
**Sent:** Wednesday, January 18, 2012 7:23 AM  
**To:** Jason Peltier; joe.findaro@akerman.com  
**Subject:** RE: Monday breakfast ?

Me too.

-----Original Message-----

From: Jason Peltier [<mailto:jpeltier@westlandswater.org>]  
Sent: Wednesday, January 18, 2012 9:21 AM  
To: joe.findaro@akerman.com  
Cc: Bernhardt, David L.  
Subject: Re: Monday breakfast ?

I show 10 to 2.

On Jan 18, 2012, at 6:19 AM, "joe.findaro@akerman.com" <joe.findaro@akerman.com> wrote:

> Sure. What is time frame of meeting ?

>

>

>

> On Jan 18, 2012, at 9:08 AM, "Jason Peltier" <jpeltier@westlandswater.org> wrote:

>

>> Sure. But how about 8:30?

>>

>> -----Original Message-----

>> From: joe.findaro@akerman.com [<mailto:joe.findaro@akerman.com>]

>> Sent: Wednesday, January 18, 2012 4:08 AM

>> To: dbernhardt@bhfs.com; jpeltier@westlandswater.org

>> Subject: Monday breakfast ?

>>

>>

>> Want to meet at Hyatt an hour before our meeting starts on Monday ?

>>

>>

>> www.akerman.com

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>

**From:** Tom Birmingham

**Sent:** Friday, January 20, 2012 8:07 AM

**To:** 'Ed Manning'; 'Carolyn Jensen'; 'Doug Subers'; joe.findaro@akerman.com; 'Bernhardt, David L.'; jpeltier@westlandswater.org; 'Tony Coelho'; 'Gayle Holman'; 'Sheila Greene'; 'Karen Clark'; 'Susan Ramos'

**Subject:** Conference Call Cancelled

Ed Manning suggested that inasmuch as we are meeting Monday, we cancel our call this morning. I agree. I apologize for the late notice.



**From:** Sheila Greene  
**Sent:** Friday, January 20, 2012 8:43 AM  
**To:** Tom Birmingham  
**Subject:** Re: Conference Call Cancelled

can I attend that meeting? would like to see these people

----- Original Message -----

From: Tom Birmingham [<mailto:tbirmingham@westlandswater.org>]  
To: 'Ed Manning' [<mailto:emanning@ka-pow.com>], 'Carolyn Jensen' [<mailto:cjensen@ka-pow.com>], 'Doug Subers' [<mailto:dsubers@ka-pow.com>], joe findaro@akerman.com, 'Bernhardt, David L.' [<mailto:DBernhardt@BHFS.com>], jpeltier@westlandswater.org, 'Tony Coelho' [<mailto:tony@onewharf.com>], 'Gayle Holman' [<mailto:gholman@westlandswater.org>], 'Sheila Greene' [<mailto:sgreene@westlandswater.org>], 'Karen Clark' [<mailto:kclark@westlandswater.org>], 'Susan Ramos' [<mailto:sramos@westlandswater.org>]  
Sent: Fri, 20 Jan 2012 07:07:08 -0800  
Subject: Conference Call Cancelled

> Ed Manning suggested that inasmuch as we are meeting Monday, we cancel our  
> call this morning. I agree. I apologize for the late notice.  
>

**From:** Tom Birmingham  
**Sent:** Friday, January 20, 2012 9:12 AM  
**To:** 'Sheila Greene'  
**CC:** 'Karen Clark'  
**Subject:** RE: Conference Call Cancelled

Yes. Please obtain the information regarding the meeting from Karen.

-----Original Message-----

From: Sheila Greene [<mailto:sgreene@westlandswater.org>]  
Sent: Friday, January 20, 2012 7:43 AM  
To: Tom Birmingham  
Subject: Re: Conference Call Cancelled

can I attend that meeting? would like to see these people

----- Original Message -----

From: Tom Birmingham [<mailto:tbirmingham@westlandswater.org>]  
To: 'Ed Manning' [<mailto:emanning@ka-pow.com>], 'Carolyn Jensen' [<mailto:cjensen@ka-pow.com>], 'Doug Subers' [<mailto:dsusers@ka-pow.com>], joe findaro@akerman.com, 'Bernhardt, David L.' [<mailto:DBernhardt@BHFS.com>], jpeltier@westlandswater.org, 'Tony Coelho' [<mailto:tony@onewharf.com>], 'Gayle Holman' [<mailto:gholman@westlandswater.org>], 'Sheila Greene' [<mailto:sgreene@westlandswater.org>], 'Karen Clark' [<mailto:kclark@westlandswater.org>], 'Susan Ramos' [<mailto:sramos@westlandswater.org>]  
Sent: Fri, 20 Jan 2012 07:07:08 -0800  
Subject: Conference Call Cancelled

> Ed Manning suggested that inasmuch as we are meeting Monday, we cancel our  
> call this morning. I agree. I apologize for the late notice.  
>

**From:** Karen Clark  
**Sent:** Friday, January 20, 2012 9:58 AM  
**To:** Sheila Greene  
**Subject:** RE: Conference Call Cancelled

Sheila,

The meeting is at 10:00 a.m. on Monday, January 23 at KP Public Affairs, 1201 K Street, Suite 800, Sacramento.

Let me know if you need anything else.

~Karen

Karen Clark  
Executive Assistant to Thomas W. Birmingham  
Westlands Water District  
P.O. Box 6056  
Fresno, CA 93703  
(o) 559.241.6234  
(f) 559.241.6277  
kclark@westlandswater.org

-----Original Message-----

From: Tom Birmingham [<mailto:tbirmingham@westlandswater.org>]  
Sent: Friday, January 20, 2012 8:12 AM  
To: 'Sheila Greene'  
Cc: 'Karen Clark'  
Subject: RE: Conference Call Cancelled

Yes. Please obtain the information regarding the meeting from Karen.

-----Original Message-----

From: Sheila Greene [<mailto:sgreene@westlandswater.org>]  
Sent: Friday, January 20, 2012 7:43 AM  
To: Tom Birmingham  
Subject: Re: Conference Call Cancelled

can I attend that meeting? would like to see these people

----- Original Message -----

From: Tom Birmingham [<mailto:tbirmingham@westlandswater.org>]  
To: 'Ed Manning' [<mailto:emanning@ka-pow.com>], 'Carolyn Jensen' [<mailto:cjensen@ka-pow.com>], 'Doug Subers' [<mailto:dsubers@ka-pow.com>], joe findaro@akerman.com, 'Bernhardt, David L.' [<mailto:DBernhardt@BHFS.com>], jpeltier@westlandswater.org, 'Tony Coelho' [<mailto:tony@onewharf.com>], 'Gayle Holman' [<mailto:gholman@westlandswater.org>], 'Sheila Greene' [<mailto:sgreene@westlandswater.org>], 'Karen Clark' [<mailto:kclark@westlandswater.org>], 'Susan Ramos' [<mailto:sramos@westlandswater.org>]  
Sent: Fri, 20 Jan 2012 07:07:08 -0800  
Subject: Conference Call Cancelled

> Ed Manning suggested that inasmuch as we are meeting Monday, we cancel  
> our call this morning. I agree. I apologize for the late notice.  
>

**From:** Jason Peltier

**Sent:** Saturday, January 21, 2012 7:26 AM

**To:** Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLOYD Fryer; 'Martin McIntyre'; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** Now add turtle to the BO soup

## **Leatherback turtle sanctuary set up on West Coast**

Peter Fimrite, Chronicle Staff Writer

San Francisco Chronicle January 21, 2012 04:00 AM Copyright San Francisco Chronicle. All rights reserved. This material may not be published, broadcast, rewritten or redistributed.

Saturday, January 21, 2012

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Federal regulators designated nearly 42,000 square miles of ocean along the West Coast as critical habitat for the Pacific leatherback turtle Friday, far less than originally proposed but still the largest protected area ever established in American waters.

The protected area is the first permanent safe haven in the waters of the continental United States for endangered leatherbacks, which swim 6,000 miles every year to eat jellyfish outside the Golden Gate.

The designation, by the National Oceanographic and Atmospheric Administration, was a bittersweet victory for environmentalists, who have been fighting to protect the marine reptiles from extinction.

The 41,914 square miles that the NOAA's National Marine Fisheries Service protected along the coasts of California, Oregon and Washington did not include the migration routes the turtles take to get to the feeding grounds. That means 28,686 square miles of habitat originally proposed for the designation was left unprotected.

"It's a big step in the right direction, but we want protections for migratory pathways," said Ben Enticknap, the Pacific project manager for Oceana, an international nonprofit dedicated to protecting the world's oceans. "I guess we've got a lot more work to do to get there."

## **How protection works**

The regulations will restrict projects that harm the turtles or the gelatinous delicacies they devour. The government will be required to review and, if necessary, regulate agricultural waste, pollution, oil spills, power plants, oil drilling, storm-water runoff and liquid natural gas projects along the California coast between Santa Barbara and Mendocino counties and off the Oregon and Washington coasts.

Aquaculture, tidal, wave turbine, desalination projects and nuclear power plants will have to consider impacts on jellyfish and sea turtles. For instance, the repermitting of the Diablo Canyon Nuclear Power Plant, in San Luis Obispo, will probably come under scrutiny.

The regulations are a response to a lawsuit filed in U.S. District Court in San Francisco in 2009 by the nonprofit environmental groups Turtle Island Restoration Network, the Center for Biological Diversity and Oceana. The groups had been trying since 2007 to establish critical habitat for leatherbacks under the Endangered Species Act. They accused the government of failing to protect the reptiles from gill-net and longline fishing, oil drilling and a variety of other activities, including wave-energy projects.

## **California habitat**

The new ruling covers 16,910 square miles along California's coast from Point Arena (Mendocino County) to Point Arguello (Santa Barbara County) to a depth of 9,000 feet. The remaining turtle habitat stretches from Cape Flattery, Wash., to Cape Blanco, Ore. seaward to a depth of a little more than 6,500 feet.

The only other critical habitat established for leatherbacks in U.S. waters is in a small area along the western end of St. Croix, in the Virgin Islands. There is also some critical habitat in Puerto Rico for green sea turtles and hawksbill sea turtles, but nothing as large as the new designation.

Turtle advocates are worried that the decision to leave out migratory routes will leave the giant sea creatures vulnerable to long lines and drift nets dragged by oceangoing vessels, which often mistakenly hook and entangle marine mammals and turtles.

Both longline and gill-net fishing are banned along the West Coast during leatherback migration, but Teri Shore, the program director for the Turtle Island Restoration Network, said the fisheries service is considering plans to expand gill-net fishing for swordfish.

## **More threats**

"Threats to these turtles are increasing, not diminishing," said Shore, whose organization also goes by its Web name, SeaTurtles.org. "We don't want to see the leatherback turtles go the way of the grizzly bear and disappear."

Leatherbacks, known scientifically as *Dermochelys coriacea*, are the largest sea turtles in the world, sometimes measuring 9 feet long and weighing as much as three refrigerators, or more than 1,200 pounds. Their life span is not fully known, but biologists believe they live at least 40 years and possibly as long as 100 years.

The worldwide population has declined by 95 percent since the 1980s because of commercial fishing, egg poaching, destruction of nesting habitat, degradation of foraging habitat and changing ocean conditions. Listed as endangered since 1970 under the Endangered Species Act, there are believed to be only 2,000 to 5,700 nesting females left in the world.

Pacific leatherbacks leave their nesting grounds in Indonesia, the Solomon Islands, Vanuatu and Papua New Guinea and swim across the Pacific Ocean to forage along the West Coast in the summer and fall. It is the longest known migration of any marine reptile.

## **Golden Gate jellyfish**

They are often seen feeding on jellyfish in the shipping lanes outside the Golden Gate, in [Monterey](#) Bay and Bodega Bay. Assemblyman Paul Fong, D-Cupertino, said Friday that he will introduce legislation designating the leatherback as California's official marine reptile in an attempt to call attention to its plight.

The newly protected zones will extend 200 miles out to sea, but they won't protect the slow-moving creatures from floating plastic bags, which look like jellyfish. A recent study found plastic in the intestinal tracts of 37 percent of 370 leatherbacks that had been found dead.

Read more: <http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2012/01/20/MN5C1MR57A.DTL#ixzz1k6R8iPoe>



**From:** Bernhardt, David L.  
**Sent:** Thursday, January 26, 2012 9:05 AM  
**To:** kclark@westlandswater.org  
**Subject:** Meeting

Karen: I know Tom has meetings in DC next week. Do you know what day he is planning on getting to town?

David Longly Bernhardt  
Brownstein Hyatt Farber Schreck, LLP  
1350 I Street, NW, Suite 510  
Washington, DC 20005-3305  
tel 202.872.5286  
fax 202.296.7009

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**From:** Karen Clark  
**Sent:** Thursday, January 26, 2012 9:30 AM  
**To:** Bernhardt, David L.  
**Subject:** RE: Meeting

Hi David,

He will be getting into DC late afternoon on January 30.

~Karen

*Karen Clark*  
*Executive Assistant to Thomas W. Birmingham*  
*Westlands Water District*  
*P.O. Box 6056*  
*Fresno, CA 93703*  
*(o) 559.241.6234*  
*(f) 559.241.6277*  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

-----Original Message-----

**From:** Bernhardt, David L. [mailto:DBernhardt@BHFS.com]  
**Sent:** Thursday, January 26, 2012 8:05 AM  
**To:** kclark@westlandswater.org  
**Subject:** Meeting

Karen: I know Tom has meetings in DC next week. Do you know what day he is planning on getting to town?

David Longly Bernhardt  
Brownstein Hyatt Farber Schreck, LLP  
1350 I Street, NW, Suite 510  
Washington, DC 20005-3305  
tel 202.872.5286  
fax 202.296.7009

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**From:** Tom Birmingham  
**Sent:** Thursday, January 26, 2012 11:22 AM  
**To:** 'Weaver, Kiel'  
**CC:** joe.findaro@akerman.com; 'Bernhardt, David L.'; 'Nelson, Damon'  
**Subject:** RE: Section 108 and Title IV

The only meetings currently set are a meeting with Mike Connor on January 31, from 10:30 – 1:30 and a meeting with Senator Feinstein on February 1 from 10:00 – 11:00.

---

**From:** Weaver, Kiel [<mailto:Kiel.Weaver@mail.house.gov>]  
**Sent:** Thursday, January 26, 2012 10:18 AM  
**To:** 'Tom Birmingham'  
**Cc:** Nelson, Damon; 'Stuart Somach'  
**Subject:** RE: Section 108 and Title IV

You may regret that offer.

---

**From:** Tom Birmingham [<mailto:tbirmingham@westlandswater.org>]  
**Sent:** Thursday, January 26, 2012 1:18 PM  
**To:** Weaver, Kiel  
**Cc:** Nelson, Damon; 'Stuart Somach'  
**Subject:** RE: Section 108 and Title IV

Thank you for the heads-up. Please let me know if there is anything I can do to help. I will be in DC next Tuesday, Wednesday, and Thursday morning. If you would like me to meet with members or staff to explain what we are attempting to do, I would be happy to attend any meeting.

---

**From:** Weaver, Kiel [<mailto:Kiel.Weaver@mail.house.gov>]  
**Sent:** Thursday, January 26, 2012 10:02 AM  
**To:** 'Stuart Somach'; Tom Birmingham  
**Cc:** Nelson, Damon  
**Subject:** FW: Section 108 and Title IV

FYI....I'm sure you will get calls soon about this.

---

**From:** Weaver, Kiel  
**Sent:** Thursday, January 26, 2012 1:01 PM  
**To:** Glenn, Kristen; Harley, Derek; Lombardi, Kyle; Wiseman, Sandra; Hanretty, Ryan  
**Cc:** Nelson, Damon  
**Subject:** Section 108 and Title IV

All,

Per the Member meeting yesterday, Chairman Hastings mentioned that we are waiting for language back from Leg Counsel. Leg Counsel continues to work on the language, specifically editing the CVPIA parts of Title 1 and San Joaquin River Restoration part of Title II. In my view, most of those titles were not the source of contention in our discussion.

However, Section 108 and Title IV were the sources of lengthy discussion. These provisions, in my view, are the most important in many ways. As such, and given Subcommittee Chairman McClintock's rightful request to vet this language one more time with your respective constituents, I send both provisions to you in Word format.

I ask that you not send this email out in shotgun fashion. Rather, send it out to the respective people you have talked with in the past to ensure that this concept is what they signed off on before or to ensure that they are comfortable

given the small changes. You will notice the addition of some small changes in Title IV to avoid sequential referral to other House Committees, a new Section 403 (TCCA/Westlands language), and a small change in Section 404. Otherwise, this should not be new to you or your people.

Given the time constraints discussed at yesterday's meeting, I ask that you get back to the group by noon DC time tomorrow. Chairman Hastings made it clear that he wants to move this bill.

**From:** Tom Birmingham  
**Sent:** Sunday, February 5, 2012 9:00 AM  
**To:** 'Weaver, Kiel'  
**CC:** 'Nelson, Damon'; 'Bernhardt, David L.'; joe.findaro@akerman.com  
**Subject:** Hastings Amendment  
**Attachments:** Hastings Amendment.docx

Kiel,  
Attached is the language you asked for. I hope it is helpful and not too late.  
Tom

Congress finds: (1) in the operation of reclamation projects throughout the seventeen western states, there is a long history of the United States deferring to the water law of the states; (2) operations of the Central Valley Project has been coordinated with operations of the California State Water Project pursuant to Public Law 99-546 (100 Stat. 3501); (3) as a result of those coordinated operations and the application of the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) to the coordinated operations of the Central Valley Project and the California State Water Project, those projects are now operated as a single project for purposes of protecting fish, wildlife, and habitat resources; and, (4) without preempting provisions of California law, the application of those state laws would frustrate Congress' authority to provide direction concerning operations of the Central Valley Project and unreasonably interfere with the private property rights of others established under California state law. These unique circumstances justify the preemption of California law by this title, and such preemption shall not be cited as precedent for preempting state law in any other state.



**From:** Bernhardt, David L.  
**Sent:** Sunday, February 5, 2012 11:36 AM  
**To:** Tom Birmingham; 'Weaver, Kiel'  
**CC:** 'Nelson, Damon'; joe.findaro@akerman.com  
**Subject:** RE: Hastings Amendment  
**Attachments:** FindingtoH.R.1837.docx

Kiel and Tom: In an effort to save time, I have reformatted the language Tom provided into amendment form. The base language was not modified, beyond line numbering.

David

---

**From:** Tom Birmingham [tbirmingham@westlandswater.org]  
**Sent:** Sunday, February 05, 2012 10:59 AM  
**To:** 'Weaver, Kiel'  
**Cc:** 'Nelson, Damon'; Bernhardt, David L.; joe.findaro@akerman.com  
**Subject:** Hastings Amendment

Kiel,  
Attached is the language you asked for. I hope it is helpful and not too late.  
Tom

## AMENDMENT TO H.R. 1873

OFFERED BY \_\_\_\_\_

At the end of the bill, add the following new section:

1 **SEC. \_\_\_\_.** **CONGRESSIONAL FINDINGS.**

2 Congress finds: (1) in the operation of reclamation projects throughout the  
3 seventeen western states, there is a long history of the United States deferring to  
4 the water law of the states; (2) operations of the Central Valley Project has been  
5 coordinated with operations of the California State Water Project pursuant to  
6 Public Law 99-546 (100 Stat. 3501); (3) as a result of those coordinated operations  
7 and the application of the Endangered Species Act of 1973 (16 U.S.C. 1531 et  
8 seq.) to the coordinated operations of the Central Valley Project and the California  
9 State Water Project, those projects are now operated as a single project for  
10 purposes of protecting fish, wildlife, and habitat resources; and, (4) without  
11 preempting provisions of California law, the application of those state laws would  
12 frustrate Congress' authority to provide direction concerning operations of the  
13 Central Valley Project and unreasonably interfere with the private property rights  
14 of others established under California state law. These unique circumstances  
15 justify the preemption of California law by this title, and such preemption shall not  
16 be cited as precedent for preempting state law in any other state.

**From:** Bernhardt, David L.  
**Sent:** Tuesday, February 7, 2012 9:41 AM  
**To:** 'Tom Birmingham'; 'Craig Manson'  
**CC:** kris.polly@waterstrategies.com  
**Subject:** RE: Irrigation

[Absolutely.](#)

---

**From:** Tom Birmingham [mailto:tbirmingham@westlandswater.org]  
**Sent:** Tuesday, February 07, 2012 11:40 AM  
**To:** 'Craig Manson'; Bernhardt, David L.  
**Cc:** kris.polly@waterstrategies.com  
**Subject:** Irrigation

Craig and David,

Today I ran into Kris Polly, the publisher of Irrigation, who said he is preparing an issue on ESA cases around the US. I suggested that rather than interviewing me for this publication, he should talk with the two of you because of your broader perspective on these cases. Please cooperate with Kris any way you can.

Thank you,

Tom

**From:** Kris Polly  
**Sent:** Tuesday, February 7, 2012 9:49 AM  
**To:** Bernhardt, David L.  
**CC:** Tom Birmingham; Craig Manson  
**Subject:** Re: Irrigation

Gentlemen--

Thank you for the opportunity to speak with you about a possible article or articles for our April issue of the Irrigation Leader magazine. The April issue will focus on ESA issues. We welcome your thoughts and input and will be happy to make space available to you.

Please let me know a good time to speak with you over the phone to discuss.

Thank you for your time.

--Kris

Kris Polly  
Water Strategies, LLC

On Feb 7, 2012, at 11:40 AM, "Bernhardt, David L." <[DBernhardt@BHFS.com](mailto:DBernhardt@BHFS.com)> wrote:

[Absolutely.](#)

---

**From:** Tom Birmingham [mailto:[tbirmingham@westlandswater.org](mailto:tbirmingham@westlandswater.org)]  
**Sent:** Tuesday, February 07, 2012 11:40 AM  
**To:** 'Craig Manson'; Bernhardt, David L.  
**Cc:** [kris.polly@waterstrategies.com](mailto:kris.polly@waterstrategies.com)  
**Subject:** Irrigation

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Thank you,

Tom

**From:** Craig Manson  
**Sent:** Tuesday, February 7, 2012 11:34 AM  
**To:** Kris Polly; Bernhardt, David L.  
**CC:** Tom Birmingham  
**Subject:** Re: Irrigation

Kris,

Glad to help. I have meetings this afternoon and tomorrow morning, but I'd be available anytime tomorrow after 1:30 PM Pacific time or Thursday anytime after 10:30 AM, or Friday anytime after 10:30 AM. I can be reached at 916-844-4979 or 916-321-4225.

Thanks,

Craig Manson

---

**From:** Kris Polly [mailto:kris.polly@waterstrategies.com]  
**To:** Bernhardt, David L. [mailto:DBernhardt@BHFS.com]  
**CC:** Tom Birmingham [mailto:tbirmingham@westlandswater.org], Craig Manson [mailto:cmanson@westlandswater.org]  
**Sent:** Tue, 07 Feb 2012 08:48:54 -0800  
**Subject:** Re: Irrigation

Gentlemen--

Thank you for the opportunity to speak with you about a possible article or articles for our April issue of the Irrigation Leader magazine. The April issue will focus on ESA issues. We welcome your thoughts and input and will be happy to make space available to you.

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--Kris

Kris Polly  
Water Strategies, LLC

On Feb 7, 2012, at 11:40 AM, "Bernhardt, David L." <[DBernhardt@BHFS.com](mailto:DBernhardt@BHFS.com)> wrote:

[Absolutely.](#)

---

**From:** Tom Birmingham [mailto:[tbirmingham@westlandswater.org](mailto:tbirmingham@westlandswater.org)]  
**Sent:** Tuesday, February 07, 2012 11:40 AM  
**To:** 'Craig Manson'; Bernhardt, David L.  
**Cc:** [kris.polly@waterstrategies.com](mailto:kris.polly@waterstrategies.com)  
**Subject:** Irrigation

Craig and David,

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Thank you,

Tom





**From:** Bernhardt, David L.  
**Sent:** Tuesday, February 7, 2012 11:53 AM  
**To:** Kris Polly  
**CC:** Tom Birmingham; Craig Manson  
**Subject:** Re: Irrigation

Kris: The best number to get me is my cell. [REDACTED] Call anytime.

Best,  
David

David Bernhardt  
[REDACTED]

On Feb 7, 2012, at 11:49 AM, "Kris Polly" <[kris.polly@waterstrategies.com](mailto:kris.polly@waterstrategies.com)> wrote:

Gentlemen--

Thank you for the opportunity to speak with you about a possible article or articles for our April issue of the Irrigation Leader magazine. The April issue will focus on ESA issues. We welcome your thoughts and input and will be happy to make space available to you.

Please let me know a good time to speak with you over the phone to discuss.

Thank you for your time.

--Kris

Kris Polly  
Water Strategies, LLC

On Feb 7, 2012, at 11:40 AM, "Bernhardt, David L." <[DBernhardt@BHFS.com](mailto:DBernhardt@BHFS.com)> wrote:

[Absolutely.](#)

---

**From:** Tom Birmingham [mailto:[tbirmingham@westlandswater.org](mailto:tbirmingham@westlandswater.org)]  
**Sent:** Tuesday, February 07, 2012 11:40 AM  
**To:** 'Craig Manson'; Bernhardt, David L.  
**Cc:** [kris.polly@waterstrategies.com](mailto:kris.polly@waterstrategies.com)  
**Subject:** Irrigation

Craig and David,

Today I ran into Kris Polly, the publisher of Irrigation, who said he is preparing an issue on ESA cases around the US. I suggested that rather than interviewing me for this publication, he should talk with the two of you because of your broader perspective on these cases. Please cooperate with Kris any way you can.

Thank you,

Tom

**From:** Bernhardt, David L.  
**Sent:** Tuesday, February 7, 2012 3:18 PM  
**To:** Craig Manson; Julie MacDonald  
**Subject:** FW: Court tosses Bush-era rule on fire-management consultations

FYI

## Court tosses Bush-era rule on fire-management consultations

Lawrence Hurley, E&E reporter

Published: Tuesday, February 7, 2012

After considering the matter for six years, a federal court yesterday threw out a George W. Bush administration rule that streamlined the consultation required by the Endangered Species Act in the course of preparing fire management plans. U.S. District Judge Gladys Kessler of the District of Columbia, who apologized in a footnote for taking so long, [reversed](#) her own 2006 ruling that had upheld the rule.

She took a second look at the request of environmental groups, including Defenders of Wildlife, which had challenged the 2003 rule in part because of the potential impact on the lynx, which is listed as a threatened species. The groups said Kessler had been too deferential to the Bush administration in upholding the rule.

In yesterday's ruling, Kessler belatedly agreed with the challengers that the rule, which restricted consultation with U.S. Fish and Wildlife Service biologists, was "arbitrary and capricious" under the Administrative Procedure Act.

At issue was the Bush administration's initial rationale for the streamlined rule, namely that it would reduce existing delays in enacting fire plans, thereby lessening the prospect of serious fires.

Kessler ruled that this purported justification is "not supported by the evidence in the record."

More recently, the Fish and Wildlife Service has changed its position. Now it says the new rule merely has the possibility of speeding up the drafting of future fire plans, Kessler noted.

The government had claimed the case was now moot because it has changed its approach, but Kessler rejected that contention.

Eric Glitzenstein, a lawyer at Meyer Glitzenstein & Crystal who represented the environmental groups, said today that "the purported rationale for the rule never made any sense and needlessly placed listed species at risk."

The Justice Department declined to comment.

Jon Hrobsky  
Policy Director  
Brownstein Hyatt Farber Schreck, LLP  
1350 I Street, NW, Suite 510  
Washington, DC 20005-7353  
T 202 872.5294  
C [REDACTED]

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**From:** Jason Peltier

**Sent:** Monday, February 13, 2012 5:38 PM

**To:** Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLoyd Fryer; 'Martin McIntyre'; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** Rep. letter to POTUS

**Attachments:** LTR - President re Commerce Reorganization 2-8-12.pdf

**Congress of the United States**  
**Washington, DC 20515**

February 8, 2012

The President  
The White House  
1600 Pennsylvania Avenue  
Washington, D.C. 20500

Dear Mr. President:

Your recently announced proposal to streamline government and save taxpayer dollars comes as welcome news to those of us who share the commitment to reducing the size of government and making it operate more efficiently. We were especially pleased to hear about your plans to consolidate business and trade agencies to make them more accessible to the public. As Americans across this country look for ways to cut their own costs, we must also continue to do more to remove redundancies and barriers that make government more bureaucratic and stifle our economy.

During your 2011 State of the Union address, you raised one issue in particular that received a great deal of attention. While discussing the need to reorganize government, you highlighted the management of salmon as an example of just how complex and convoluted the federal government has become, stating that "the Interior Department is in charge of salmon while they're in fresh water, but the Commerce Department handles them in when they're in saltwater. And I hear it gets even more complicated once they're smoked." While this was probably meant to be tongue-in-cheek, the point resonates in places like California, where fisheries management among the various federal and state agencies has proven ineffective and has had dramatic impacts on the water supplies that two-thirds of the state depends upon.

As we have previously discussed, water that is used to irrigate one of America's richest agricultural regions in the San Joaquin Valley of California (Valley) has been limited in recent years as a result of two sets of different proposals, or "biological opinions," issued by the U.S. Fish and Wildlife Service (FWS) within the Department of the Interior and National Marine Fisheries Service (NMFS) within the Department of Commerce to protect endangered fish species within the region. In December 2008, FWS released proposals to protect Delta smelt and in June 2009, NMFS released proposals to protect winter and spring-run Chinook salmon, green sturgeon, Central Valley steelhead, and Southern Resident killer whales. Regrettably, these biological opinions call for substantial reductions in Central Valley and State Water Project water exports that are vital to farmers, farmworkers, and farming communities we represent south of the Sacramento-San Joaquin Delta.

As a result, you may be aware that the past several years have been wrought with high unemployment numbers in Valley cities and towns, litigation in courts, and water supply cutbacks continuing to hamper economic growth throughout the region.

In numerous instances, these two separate biological opinions have been shown to use flawed science because they only examine the factors that are within the jurisdiction of either agency, although they share the same missions and cover the same ecosystem. In this way, the biological opinions are narrow in scope, only looking at water exports and water temperature instead of factors that also affect fish abundance such as urban and agricultural runoff, wastewater discharges, predation, ocean conditions, upstream diversions, private unscreened diversions, and climate change. What's more, the data used by NMFS and FWS to formulate these proposals is not integrated, so they often work on entirely different timelines and even at cross purposes while most of California is left hanging in the balance.

Mr. President, we can do much better and we should. For these reasons and many more, your proposal to house the fish agencies together within one roof makes good sense and is long overdue. We lend our support to your efforts to move the National Oceanic and Atmospheric Administration (NOAA) into the Department of the Interior. We look forward to working with you on this proposal and other commonsense efforts to streamline government.



JIM COSTA  
Member of Congress

Sincerely,



DENNIS CARDOZA  
Member of Congress



**From:** Bernhardt, David L.

**Sent:** Wednesday, February 15, 2012 5:57 AM

**To:** joe.findaro@akerman.com; Jason Peltier; Thomas W. (Tom) Birmingham Esq.

**Subject:** Today's E&E story

## **8.WATER:**

### **Vote planned on bill rewriting Calif. rationing, fish rules**

**Anne C. Mulkern, E&E reporter**

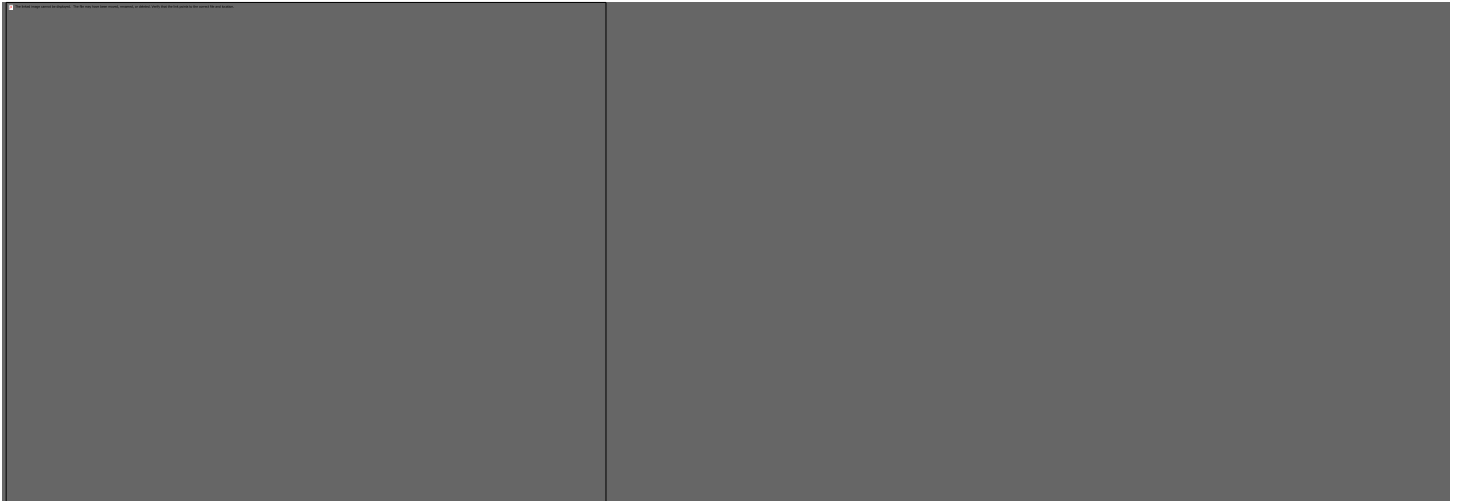
*Published: Wednesday, February 15, 2012*

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Existing rules for fish protection and water rationing in California would be rewritten under GOP legislation lawmakers will consider tomorrow.

The House Natural Resources Committee at 10 a.m. tomorrow will consider amendments to [H.R. 1837](#), a measure from Rep. Devin Nunes (R-Calif.) The legislation would overturn an agreement for water use in the Golden State's San Joaquin River. That settlement became federal law when Congress in 2009 passed legislation that codified a court settlement.

Republicans have said that the settlement puts the needs of fish above those of people.

"I've traveled to California and heard firsthand how the man-made drought severely impacted farming communities in the San Joaquin Valley," said committee Chairman Doc Hastings (R-Wash.) in a statement. "The Pelosi-led Congress sat idly by and did nothing, while we are delivering on a package now that delivers

real relief to parts of northern and southern California. I applaud my California colleagues in finding a fair compromise on this important legislation."

A major amendment will be offered during the session, the GOP side of the committee said. It did not give details on that change but said that the bill, as amended, "will now secure northern California's property rights and offer unprecedented protections for senior water rights holders."

Nunes' bill as now written would repeal the 2009 law on central California water uses and replace it with 1994 rules from an agreement known as the Bay-Delta Accord. The measure would set compliance with the Endangered Species Act to that year.

Current governance on water in the region became law when the San Joaquin River Restoration Settlement Act from Sen. Dianne Feinstein (D-Calif.) was included in a 2009 omnibus lands bill. Feinstein's measure enacted a 2006 court agreement on water flows, salmon and endangered species in the San Joaquin River. The Natural Resources Defense Council and other groups had sued the Interior and Commerce departments over rules that had been in place since the early 1990s. Under the court settlement, new limits were placed on the amounts of water certain farmers can take for irrigation.

Nunes' bill, in addition to stripping out those restrictions, would eliminate an existing tiered pricing system for water use. It would change water contracts so they last 40 years instead of 25, and they could be automatically renewed. It also would eliminate a requirement that new and renewed contracts must undergo an environmental impact study.

Republicans on the committee in a statement called the bill "a comprehensive solution that would restore water deliveries that have been cut-off due to federal regulations and environmental lawsuits, ensure a reliable water supply for people and fish, secure water rights, and save taxpayer money by ending unnecessary and dubious government projects. The bill could protect up to 30,000 jobs, generate millions in expedited federal revenue, and save American taxpayers and ratepayers hundreds of millions of dollars."

Democrats have described the legislation as dangerous.

"This bill would radically change the way we balance water and the environment in California," Rep. Grace Napolitano (D-Calif.) said at a House Natural Resources Water and Power Subcommittee hearing in June ([E&E Daily](#), June 3, 2011). "New federal rules would override state law, exempting certain agricultural water users from following environmental restrictions or from having to contribute to the health of our natural water sources, as other users do."

Both Feinstein and Sen. Barbara Boxer (D-Calif.) have written letters opposing the bill. Democrats hope that means the measure will ultimately die in the upper chamber even if it passes the House.



**From:** Jason Peltier

**Sent:** Wednesday, February 22, 2012 5:42 AM

**To:** T Birmingham (tbirmingham@westlandswater. org); Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLoyd Fryer; 'Martin McIntyre'; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** Gleick loses SFGate blog

<http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2012/02/21/BA0R1NAEQI.DTL>

**From:** Tom Birmingham  
**Sent:** Wednesday, February 22, 2012 7:37 PM  
**To:** 'Costa, Jim'  
**CC:** 'Bernhardt, David L.'; joe.findaro@akerman.com; 'Tony Coelho'  
**Subject:** Potential Democrat Votes

Jim,

As we discussed on the telephone, the following are the Democrat members of the House that we have identified as potential yes votes on HR 1837:

*Altmire, Jason (PA);  
Barrow, John (GA);  
Bishop, Sanford (GA);  
Bishop, Sanford (GA);  
Boren, Dan (OK);  
Boswell, Leonard (IA);  
Cooper, Jim (TN);  
Critz, Mark (PA);  
Cuellar, Henry (TX);  
Donnelly, Joe (IN);  
Green, AL (TX);  
Green, Gene (TX);  
Hinojosa, Ruben (TX);  
Hochul, Kathy (NY);  
Kissell, Larry (NC);  
Matheson, Jim (UT);  
McIntyre, Mike (NC);  
Owens, Bill (NY);  
Peterson, Collin (MN);  
Richmond, Cedric (LA);  
Ross, Mike (AK)*

There may be others; please let us know. And if there is anything that David Bernhardt or Joe Findaro can do to help with these members, please let them know.

As always, thank you for your help.

Tom

**From:** Bernhardt, David L.  
**Sent:** Monday, February 27, 2012 6:52 AM  
**To:** Jason Peltier (jpeltier@westlandswater.org)  
**Subject:** FYI-- In today's E&E Daily

WATER:

GOP Bay-Delta bill up for floor vote

Paul Quinlan, E&E reporter

Published: Monday, February 27, 2012

The House Rules Committee will meet tomorrow afternoon to decide which amendments will be allowed in this week's floor debate on a bill to divert some of California's limited water supplies from environmental uses to thirsty farms and businesses.

Rules Chairman David Dreier (R-Calif.) said the panel may limit the amendment process for floor consideration of the San Joaquin Valley Water Reliability Act (H.R. 1837).

The bill is sponsored by California Republican Devin Nunes and passed the House Natural Resources Committee earlier this month (E&E Daily, Feb. 17).

Members wishing to offer an amendment have until 10 a.m. tomorrow to submit them to the committee, Dreier said in a letter posted on the committee's website.

The Natural Resources Committee passed the bill in a 27-17 vote after a marathon hearing in which Democrats trotted out a slew of amendments intended to defang the bill and spotlight what they said were the most objectionable provisions.

Republicans tout the bill as the solution to the "man-made" drought afflicting California as a result of onerous environmental regulations that put fish before people.

In committee, they cited staggering unemployment figures and food shortage-triggered "bread lines." They also noted that billions of gallons of water were flushed into the Bay-Delta and out to sea on behalf of a small endangered fish, the delta smelt.

"This committee will not sit idly by and watch a repeat of such a government-caused tragedy," said committee Chairman Doc Hastings (R-Wash.).

Democrats countered that the legislation would recklessly overturn decades of environmental and water law and legal precedent and incur dire unintended consequences, ravaging fisheries, wrecking the Bay-Delta ecosystem, ruining water-dependent national wildlife refuges and setting dangerous precedent for other states to follow suit with similar legislation.

"What we have in this legislation is a law that would take California water law, policy and history and turn it upside down," said Rep. John Garamendi (D-Calif.). "It is a radical change."

Schedule: The meeting is tomorrow at 3 p.m. in H-313 of the Capitol

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This transmission and any attachment is attorney privileged and confidential. Any dissemination or copying of this communication is prohibited. If you are not the intended recipient, please notify us immediately by replying and delete the message. Thank you.

**From:** Jason Peltier

**Sent:** Monday, February 27, 2012 9:32 AM

**To:** 'Bernhardt, David L.'; 'Tom Birmingham'; joe.findaro@akerman.com

**CC:** 'Don Peracchi'; 'Daniel Errotabere'; 'Donald Devine'; 'Frank Coelho, Jr.'; gesajian@westlandswater.org; 'Larry Enos'; 'Todd Neves'; 'Sarah Clark Woolf'; asano@westlandswater.org

**Subject:** Fresno Bee today

# Contentious bill would reshape the restoration of San Joaquin River

By Michael Doyle and Mark Grossi - The Fresno Bee

By Michael Doyle and Mark Grossi The Fresno Bee

*Sunday, Feb. 26, 2012 | 10:00 PM* *Modified Mon, Feb 27, 2012 07:07 AM*

River's meandering course through central California would get steered in yet another direction under a far-reaching bill set for House approval this week.

Salmon would be out. Other fish would be in. One restoration program would end. Another would start. Water would flow below Friant Dam north of Fresno, but not nearly as much as currently planned.

Biologically, scientists say, the House proposal has promise. Politically, it faces strong opposition. Legally, it appears vulnerable to challenge. Bottom line: When the biggest California water bill in years hits the House floor, as it is expected to do Wednesday, the San Joaquin River will be incontrovertibly front and center.

"The San Joaquin River," chief bill author Rep. Devin Nunes, R-Visalia said, "is the lynchpin of the entire bill."

The river section spans nearly half of the 53-page Sacramento-San Joaquin Valley Water Reliability Act. The section is titled "Repeal of the San Joaquin River Settlement," though "repeal" does not really convey the consequences.

Instead, if the section survives, it would replace a cold-water fishery, in which salmon return to the San Joaquin River, with a less expensive warm-water fishery, conducive to other river-loving species.

"I think it's a reasonable thing to propose," said Doug Welch, natural resources planner with the Chowchilla Water District, which joined other farm water groups in agreeing to the current salmon plan. "The jury is still out on restoring a self-reproducing salmon run."

Elsewhere, the new House bill restores longer irrigation contracts, preempts strict state laws and eases water transfers. It offers more water for San Joaquin Valley farms, while painstakingly negotiated language is designed to ease Sacramento Valley fears about supplies being shipped south.

The overall bill sharply divides the state, and its long-term prospects are uncertain.

The bill's authors have rallied the public support of some 70 California water districts, 20 farm organizations and 20 cities and counties, among others.

"This treats our water as the precious resource it is, and restores balance between human and environmental uses of that resource," said Rep. Tom McClintock, R-Elk Grove, chairman of the House water and power subcommittee.

But 10 House Democrats from Northern California oppose the overall bill, as do the state's two senators and the administration of Gov. Jerry Brown. The House Democrats, who together represent about 7 million residents, say they were shut out of the months-long bill drafting that occurred under McClintock's oversight.

"Sacramento is concerned that this legislation would create chaos in the already challenged context of the Sacramento-San Joaquin Delta," said Sacramento City Council Member Jay Schenirer, adding that, "Sacramento has not been allowed to be at the table or to address its concerns."

The bill's San Joaquin River provision blocks a 2009 law, which Congress passed to implement a lawsuit settlement reached between environmentalists and Friant Water Users Authority farmers.

The settlement requires additional water to be released through Friant Dam, and for myriad river channel improvements, so salmon can be returned starting this year. The average releases would be about 200,000 acre-feet, about 15% of the total available.

The Nunes bill, by contrast, would send an estimated 100,000 acre-feet of water down the river channel, less than half of the river settlement's average. Supporters say a warming climate will make it more difficult for cold-water fish, such as salmon, to survive as far south as Fresno. Other native fish might do very well under the alternative warm-water plan, including trout, Sacramento sucker and threespine stickleback.

---

**From:** Bernhardt, David L. [mailto:DBernhardt@BHFS.com]  
**Sent:** Monday, February 27, 2012 8:18 AM  
**To:** Tom Birmingham; joe.findaro@akerman.com  
**Cc:** 'Don Peracchi'; 'Daniel Errotabere'; 'Donald Devine'; 'Frank Coelho, Jr.'; gesajian@westlandswater.org; 'Larry Enos'; 'Todd Neves'; 'Sarah Clark Woolf'; asano@westlandswater.org; 'Jason Peltier'  
**Subject:** RE: Letters

Tom: We can get copies of the response to each of the CA republicans offices. However, it would be more typical for either McClintock's office, or the bill's sponsors or co-sponsors to send it around as a heads up email, or a dear colleague. I suggest, Joe and I reach out to a couple of offices and make sure that the comments are being circulated. If that is not happening, or for some reason, the staff are not interested in circulating the points, we can do so ourselves.

---

**From:** Tom Birmingham [mailto:tbirmingham@westlandswater.org]  
**Sent:** Monday, February 27, 2012 11:06 AM  
**To:** Bernhardt, David L.; joe.findaro@akerman.com  
**Cc:** 'Don Peracchi'; 'Daniel Errotabere'; 'Donald Devine'; 'Frank Coelho, Jr.'; gesajian@westlandswater.org; 'Larry Enos'; 'Todd Neves'; 'Sarah Clark Woolf'; asano@westlandswater.org; 'Jason Peltier'  
**Subject:** FW: Letters

Joe and David,

I received the following from Damon Nelson. It relates a form letter that is be written in opposition to HR 1837. Tom McClintock wrote a response to a San Francisco Chronicle editorial that made some of the same fallacious arguments as the form letter. His response can be found on his website, at the following link:

<http://mcclintock.house.gov/2012/02/response-san-francisco-chronicle.shtml>

I wonder if we shouldn't make copies of this web page for distribution to Republican members. What are your thoughts?

Tom

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**From:** Nelson, Damon [<mailto:Damon.Nelson@mail.house.gov>]  
**Sent:** Monday, February 27, 2012 5:30 AM  
**To:** Thomas Birmingham ([tbirmingham@westlandswater.org](mailto:tbirmingham@westlandswater.org))  
**Subject:** Letters

We started getting form letters in opposition over the weekend. While we only got five, our system only allows constituents to contact us. So, I'm sure other members got them too. Here is one below.

Please vote NO on H.R. 1837 (Nunes). This environmentally destructive bill overturns the public trust provisions of the California Constitution and usurps state water rights authority. It will harm the state's endangered salmon and steelhead. The bill will also dry up the recently restored San Joaquin River and likely increase federal diversions from the environmentally fragile Delta. This bill will kill jobs and destroy the fabric of our communities that rely on healthy rivers and watershed.

Please do not vote for this bill, which tramples California's right to manage its water and takes public water away from the environment and gives it to a handful of large agribusiness corporations. The bill fails to adequately protect family farmers in the northern Central Valley and Delta by weakening state water rights law and centralizing more federal authority over water management decisions. Provisions carved out to serve selected water diverters in Northern California will play havoc with the state's water rights and harm long standing agreements like those protecting the flows of the American and Sacramento Rivers.

This bill was developed in secret by a handful of Representatives beholden to corporate irrigators in the southern Central Valley, without any input from the majority of California's House delegation. It will roll back nearly two decades of progress restoring reasonable flows in our rivers and rebuilding the state's once vibrant commercial and sport salmon fisheries...Please vote NO on H.R. 1837, ground surface water storage is not the answer to California water problem you cannot store what we do not have. Look to the ocean.

-----  
Damon Nelson  
Deputy Chief of Staff & Legislative Director  
Congressman Devin Nunes  
Office: (202) 225-2523

**Office Mission** To ensure our constituents and all Americans live free and prosperous lives in a healthy and safe environment by serving, communicating, protecting and representing them in a professional and caring manner.



**From:** Tom Birmingham

**Sent:** Tuesday, February 28, 2012 12:00 PM

**To:** 'Bernhardt, David L.'; joe.findaro@akerman.com

**CC:** 'Don Peracchi'; 'Daniel Errotabere'; 'Donald Devine'; 'Frank Coelho, Jr.'; gesajian@westlandswater.org; 'Larry Enos'; 'Todd Neves'; 'Sarah Clark Woolf'; asano@westlandswater.org

**Subject:** Letter to Collin Peterson

**Attachments:** Ltr to Collin Peterson.docx

David and Joe,

Please print the attached letter and have it delivered to Collin Peterson's office this afternoon.

Thank you,

Tom





February 28, 2012

The Honorable Collin C. Peterson  
2211 Rayburn HOB  
Washington, DC 20515

RE: H.R. 1837 – The Sacramento – San Joaquin Valley Water Reliability Act

Dear Mr. Peterson:

I am writing on behalf of Westlands Water District to urge that you support H.R. 1837, the Sacramento – San Joaquin Valley Water Reliability Act, when it is considered by the House of Representatives. Westlands is a California water district that serves irrigation water to an area of approximately 600,000 acres on the westside of the San Joaquin Valley in Fresno and Kings counties. Westlands is one of the most fertile, productive and diversified farming regions in the nation. Rich soil, a good climate, and innovative farm management have helped make the area served by Westlands one of the most productive farming areas in the San Joaquin Valley and the nation. Westlands farmers produce over 50 commercial fiber and food crops sold for the fresh, dry, and canned or frozen food markets; domestic and export. These crops have a value in excess of \$1 billion, and they are an important factor in ensuring that American families will continue to enjoy a food supply that is abundant, safe, and affordable. However, like most regions of the arid west, the production of these crops depends on the availability of water for irrigation.

Over the course of the last two decades, the implementation of the Endangered Species Act and the Central Valley Project Improvement Act has significantly limited the supply of water for family farmers throughout the Central Valley, but particularly on the westside of the San Joaquin Valley. These two laws have threatened the viability of irrigated agriculture in one of the most productive regions of this nation, and the enactment of H.R. 1837 would restore water supplies to this region and help sustain an agricultural economy that employs tens-of-thousands of people and helps feed the nation.

In particular, the provisions of H.R. 1837 would make changes to the Central Valley Project Improvement Act and other laws to eliminate out-dated federal and state protections for invasive fish species; restore certainty for Central Valley Project water supply contracts; facilitate water transfers; establish a stakeholder oversight panel for the Central Valley Project Restoration Fund; strengthen requirements to enhance Central Valley Project water yields; and provide a common-sense framework for environmental protections in the Sacramento – San Joaquin Delta.

This latter point has been lost in the debate on H.R. 1837. Opponents of the legislation ignore that under the provisions of H.R. 1837, the Central Valley Project and State Water Project would annually manage approximately 2 million acre-feet of water for fish and wildlife restoration and enhancement. Importantly, H.R. 1837 would require that federal and state fishery agencies more efficiently manage water supplies dedicated to fish and wildlife restoration and enhancement, holding environmental uses of water to the same standard currently applied to farmers throughout the Sacramento and San Joaquin Valleys.

Other provision of H.R. 1837 provide all Central Valley Project contractors the opportunity to prepay their respective capital obligations associated with the project, thus providing additional revenues to the Federal government while offering contractors the option to better manage their own finances and putting them in the same position as the majority of other Reclamation contractors across the West.

Finally, H.R.1837 contains provisions that would protect the interests of senior water rights holders in and would, contrary to the claims of H.R. 1837's opponents, provide an unprecedented federal statutory recognition of, and commitment to, California's state water rights priority system and area of origin protections. These provisions of H.R. 1837 are critical to ensure that water rights in California are protected from excessive regulation or outright takings.

H.R. 1837 is critically needed legislation to ensure the viability of irrigated agriculture in the San Joaquin Valley, and it is supported by Members of Congress like Dennis Cardoza and Jim Costa, who understand the draconian effects that unwarranted regulatory water supply shortages have on the people who live and work in the Valley. Westlands urges that you vote for this important legislation.

Very truly yours,



Thomas W. Birmingham  
General Manager

cc: The Honorable Dennis Cardoza  
The Honorable Jim Costa

**From:** Tom Birmingham  
**Sent:** Tuesday, February 28, 2012 12:28 PM  
**To:** kclark@westlandswater.org  
**CC:** 'Bernhardt, David L.'  
**Subject:** Letter to Kurt Schrader  
**Attachments:** Ltr to Kurt Schrader.docx

Karen,

Please put the attached letter on District letter head and send to David ASAP for delivery to Mr. Schrader's office.  
Tom

February 28, 2012

The Honorable Kurt Schrader  
314 Cannon House Office Building  
Washington, DC 20515

RE: H.R. 1837 – The Sacramento – San Joaquin Valley Water Reliability Act

Dear Mr. Schrader:

I am writing on behalf of Westlands Water District to urge that you support H.R. 1837, the Sacramento – San Joaquin Valley Water Reliability Act, when it is considered by the House of Representatives. Westlands is a California water district that serves irrigation water to an area of approximately 600,000 acres on the westside of the San Joaquin Valley in Fresno and Kings counties. Westlands is one of the most fertile, productive and diversified farming regions in the nation. Rich soil, a good climate, and innovative farm management have helped make the area served by Westlands one of the most productive farming areas in the San Joaquin Valley and the nation. Westlands farmers produce over 50 commercial fiber and food crops sold for the fresh, dry, and canned or frozen food markets; domestic and export. These crops have a value in excess of \$1 billion, and they are an important factor in ensuring that American families will continue to enjoy a food supply that is abundant, safe, and affordable. However, like most regions of the arid west, the production of these crops depends on the availability of water for irrigation.

Over the course of the last two decades, the implementation of the Endangered Species Act and the Central Valley Project Improvement Act has significantly limited the supply of water for family farmers throughout the Central Valley, but particularly on the westside of the San Joaquin Valley. These two laws have threatened the viability of irrigated agriculture in one of the most productive regions of this nation, and the enactment of H.R. 1837 would restore water supplies to this region and help sustain an agricultural economy that employs tens-of-thousands of people and helps feed the nation.

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H.R. 1837 is critically needed legislation to ensure the viability of irrigated agriculture in the San Joaquin Valley, and it is supported by Members of Congress like Dennis Cardoza and Jim Costa, who understand the draconian effects that unwarranted regulatory water supply shortages have on the people who live and work in the Valley. Westlands urges that you vote for this important legislation.

Very truly yours,



Thomas W. Birmingham  
General Manager

cc: The Honorable Dennis Cardoza  
The Honorable Jim Costa

**From:** Karen Clark  
**Sent:** Tuesday, February 28, 2012 12:36 PM  
**To:** David Bernhardt  
**CC:** Tom Birmingham  
**Subject:** Letter to Kurt Schrader  
**Attachments:** Ltr to Schrader.doc

Hello David,

Here is another letter for delivery.

Sincerely,

~Karen

*Karen Clark*  
*Executive Assistant to Thomas W. Birmingham*  
*Westlands Water District*  
*P.O. Box 6056*  
*Fresno, CA 93703*  
(c) [REDACTED]  
(f) 559.241.6277  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

-----Original Message-----

**From:** Tom Birmingham [mailto:tbirmingham@westlandswater.org]  
**Sent:** Tuesday, February 28, 2012 11:28 AM  
**To:** kclark@westlandswater.org  
**Cc:** 'Bernhardt, David L.'  
**Subject:** Letter to Kurt Schrader

Karen,

Please put the attached letter on District letter head and send to David ASAP for delivery to Mr. Schrader's office.  
Tom



## Westlands Water District

3130 N. Fresno Street, P.O. Box 6056, Fresno, California 93703-6056, (559) 224-1523, FAX (559) 241-6277

February 28, 2012

The Honorable Kurt Schrader  
314 Cannon House Office Building  
Washington, DC 20515

RE: H.R. 1837 – The Sacramento – San Joaquin Valley Water Reliability Act

Dear Mr. Schrader:

I am writing on behalf of Westlands Water District to urge that you support H.R. 1837, the Sacramento – San Joaquin Valley Water Reliability Act, when it is considered by the House of Representatives. Westlands is a California water district that serves irrigation water to an area of approximately 600,000 acres on the westside of the San Joaquin Valley in Fresno and Kings counties. Westlands is one of the most fertile, productive and diversified farming regions in the nation. Rich soil, a good climate, and innovative farm management have helped make the area served by Westlands one of the most productive farming areas in the San Joaquin Valley and the nation. Westlands farmers produce over 50 commercial fiber and food crops sold for the fresh, dry, and canned or frozen food markets; domestic and export. These crops have a value in excess of \$1 billion, and they are an important factor in ensuring that American families will continue to enjoy a food supply that is abundant, safe, and affordable. However, like most regions of the arid west, the production of these crops depends on the availability of water for irrigation.

Over the course of the last two decades, the implementation of the Endangered Species Act and the Central Valley Project Improvement Act has significantly limited the supply of water for family farmers throughout the Central Valley, but particularly on the westside of the San Joaquin Valley. These two laws have threatened the viability of irrigated agriculture in one of the most productive regions of this nation, and the enactment of H.R. 1837 would restore water supplies to this region and help sustain an agricultural economy that employs tens-of-thousands of people and helps feed the nation.

In particular, the provisions of H.R. 1837 would make changes to the Central Valley Project Improvement Act and other laws to eliminate out-dated federal and state protections for invasive fish species; restore certainty for Central Valley Project water supply contracts; facilitate water transfers; establish a stakeholder oversight panel for

the Central Valley Project Restoration Fund; strengthen requirements to enhance Central Valley Project water yields; and provide a common-sense framework for environmental protections in the Sacramento – San Joaquin Delta.

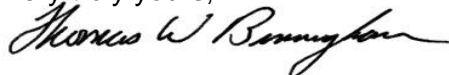
This latter point has been lost in the debate on H.R. 1837. Opponents of the legislation ignore that under the provisions of H.R. 1837, the Central Valley Project and State Water Project would annually manage approximately 2 million acre-feet of water for fish and wildlife restoration and enhancement. Importantly, H.R. 1837 would require that federal and state fishery agencies more efficiently manage water supplies dedicated to fish and wildlife restoration and enhancement, holding environmental uses of water to the same standard currently applied to farmers throughout the Sacramento and San Joaquin Valleys.

Other provision of H.R. 1837 provide all Central Valley Project contractors the opportunity to prepay their respective capital obligations associated with the project, thus providing additional revenues to the Federal government while offering contractors the option to better manage their own finances and putting them in the same position as the majority of other Reclamation contractors across the West.

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H.R. 1837 is critically needed legislation to ensure the viability of irrigated agriculture in the San Joaquin Valley, and it is supported by Members of Congress like Dennis Cardoza and Jim Costa, who understand the draconian effects that unwarranted regulatory water supply shortages have on the people who live and work in the Valley. Westlands urges that you vote for this important legislation.

Very truly yours,



Thomas W. Birmingham  
General Manager

cc: The Honorable Dennis Cardoza  
The Honorable Jim Costa



**From:** Tom Birmingham

**Sent:** Tuesday, February 28, 2012 1:52 PM

**To:** 'Bernhardt, David L.'; joe.findaro@akerman.com

**Subject:** FW: Letters on HR 1837

**Attachments:** Ltr to Collin Peterson.docx; Ltr to Kurt Schrader.docx; Ltr to Boswell.docx; Ltr to Scott.docx; Ltr to Walz.docx; Ltr to Kissell.docx; Ltr to McIntyre.docx; Ltr to Henry Cuellar.docx

I sent the attached letters. With the exception of the letters to Peterson and Schrader, the letters were delivered by a staff person in Nunes' office.

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**From:** Tom Birmingham [mailto:tbirmingham@westlandswater.org]

**Sent:** Tuesday, February 28, 2012 12:48 PM

**To:** 'Murray, Jaclyn'; 'Petersen, Scott'

**Subject:** Letters on HR 1837

Jaclyn and Scott,

I have sent the attached letters to Democrat members of the Ag Committee.

Thank you for your help.

Tom



February 28, 2012

The Honorable Collin C. Peterson  
2211 Rayburn HOB  
Washington, DC 20515

RE: H.R. 1837 – The Sacramento – San Joaquin Valley Water Reliability Act

Dear Mr. Peterson:

I am writing on behalf of Westlands Water District to urge that you support H.R. 1837, the Sacramento – San Joaquin Valley Water Reliability Act, when it is considered by the House of Representatives. Westlands is a California water district that serves irrigation water to an area of approximately 600,000 acres on the westside of the San Joaquin Valley in Fresno and Kings counties. Westlands is one of the most fertile, productive and diversified farming regions in the nation. Rich soil, a good climate, and innovative farm management have helped make the area served by Westlands one of the most productive farming areas in the San Joaquin Valley and the nation. Westlands farmers produce over 50 commercial fiber and food crops sold for the fresh, dry, and canned or frozen food markets; domestic and export. These crops have a value in excess of \$1 billion, and they are an important factor in ensuring that American families will continue to enjoy a food supply that is abundant, safe, and affordable. However, like most regions of the arid west, the production of these crops depends on the availability of water for irrigation.

Over the course of the last two decades, the implementation of the Endangered Species Act and the Central Valley Project Improvement Act has significantly limited the supply of water for family farmers throughout the Central Valley, but particularly on the westside of the San Joaquin Valley. These two laws have threatened the viability of irrigated agriculture in one of the most productive regions of this nation, and the enactment of H.R. 1837 would restore water supplies to this region and help sustain an agricultural economy that employs tens-of-thousands of people and helps feed the nation.

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Very truly yours,



Thomas W. Birmingham  
General Manager

cc: The Honorable Dennis Cardoza  
The Honorable Jim Costa

February 28, 2012

The Honorable Kurt Schrader  
314 Cannon House Office Building  
Washington, DC 20515

RE: H.R. 1837 – The Sacramento – San Joaquin Valley Water Reliability Act

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Very truly yours,



Thomas W. Birmingham  
General Manager

cc: The Honorable Dennis Cardoza  
The Honorable Jim Costa



## Westlands Water District

3130 N. Fresno Street, P.O. Box 6056, Fresno, California 93703-6056, (559) 224-1523, FAX (559) 241-6277

February 28, 2012

The Honorable Leonard Boswell  
1026 Longworth House Office Building  
Washington, DC 20515

RE: H.R. 1837 – The Sacramento – San Joaquin Valley Water Reliability Act

Dear Mr. Boswell:

I am writing on behalf of Westlands Water District to urge that you support H.R. 1837, the Sacramento – San Joaquin Valley Water Reliability Act, when it is considered by the House of Representatives. Westlands is a California water district that serves irrigation water to an area of approximately 600,000 acres on the westside of the San Joaquin Valley in Fresno and Kings counties. Westlands is one of the most fertile, productive and diversified farming regions in the nation. Rich soil, a good climate, and innovative farm management have helped make the area served by Westlands one of the most productive farming areas in the San Joaquin Valley and the nation. Westlands farmers produce over 50 commercial fiber and food crops sold for the fresh, dry, and canned or frozen food markets; domestic and export. These crops have a value in excess of \$1 billion, and they are an important factor in ensuring that American families will continue to enjoy a food supply that is abundant, safe, and affordable. However, like most regions of the arid west, the production of these crops depends on the availability of water for irrigation.

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Very truly yours,

  
Thomas W. Birmingham  
General Manager

cc: The Honorable Dennis Cardoza  
The Honorable Jim Costa



## Westlands Water District

3130 N. Fresno Street, P.O. Box 6056, Fresno, California 93703-6056, (559) 224-1523, FAX (559) 241-6277

February 28, 2012

The Honorable David Scott  
225 Cannon House Office Building  
Washington, DC 20515

RE: H.R. 1837 – The Sacramento – San Joaquin Valley Water Reliability Act

Dear Mr. Scott:

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Other provision of H.R. 1837 provide all Central Valley Project contractors the opportunity to prepay their respective capital obligations associated with the project, thus providing additional revenues to the Federal government while offering contractors the option to better manage their own finances and putting them in the same position as the majority of other Reclamation contractors across the West.

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Very truly yours,

  
Thomas W. Birmingham  
General Manager

cc: The Honorable Dennis Cardoza  
The Honorable Jim Costa



## Westlands Water District

3130 N. Fresno Street, P.O. Box 6056, Fresno, California 93703-6056, (559) 224-1523, FAX (559) 241-6277

February 28, 2012

The Honorable Tim Walz  
1722 Longworth House Office Building  
Washington, DC 20515

RE: H.R. 1837 – The Sacramento – San Joaquin Valley Water Reliability Act

Dear Mr. Walz:

I am writing on behalf of Westlands Water District to urge that you support H.R. 1837, the Sacramento – San Joaquin Valley Water Reliability Act, when it is considered by the House of Representatives. Westlands is a California water district that serves irrigation water to an area of approximately 600,000 acres on the westside of the San Joaquin Valley in Fresno and Kings counties. Westlands is one of the most fertile, productive and diversified farming regions in the nation. Rich soil, a good climate, and innovative farm management have helped make the area served by Westlands one of the most productive farming areas in the San Joaquin Valley and the nation. Westlands farmers produce over 50 commercial fiber and food crops sold for the fresh, dry, and canned or frozen food markets; domestic and export. These crops have a value in excess of \$1 billion, and they are an important factor in ensuring that American families will continue to enjoy a food supply that is abundant, safe, and affordable. However, like most regions of the arid west, the production of these crops depends on the availability of water for irrigation.

Over the course of the last two decades, the implementation of the Endangered Species Act and the Central Valley Project Improvement Act has significantly limited the supply of water for family farmers throughout the Central Valley, but particularly on the westside of the San Joaquin Valley. These two laws have threatened the viability of irrigated agriculture in one of the most productive regions of this nation, and the enactment of H.R. 1837 would restore water supplies to this region and help sustain an agricultural economy that employs tens-of-thousands of people and helps feed the nation.

In particular, the provisions of H.R. 1837 would make changes to the Central Valley Project Improvement Act and other laws to eliminate out-dated federal and state protections for invasive fish species; restore certainty for Central Valley Project water supply contracts; facilitate water transfers; establish a stakeholder oversight panel for the Central Valley Project Restoration Fund; strengthen requirements to enhance Central Valley Project water yields; and provide a

common-sense framework for environmental protections in the Sacramento – San Joaquin Delta.


This latter point has been lost in the debate on H.R. 1837. Opponents of the legislation ignore that under the provisions of H.R. 1837, the Central Valley Project and State Water Project would annually manage approximately 2 million acre-feet of water for fish and wildlife restoration and enhancement. Importantly, H.R. 1837 would require that federal and state fishery agencies more efficiently manage water supplies dedicated to fish and wildlife restoration and enhancement, holding environmental uses of water to the same standard currently applied to farmers throughout the Sacramento and San Joaquin Valleys.

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Very truly yours,

  
Thomas W. Birmingham  
General Manager

cc: The Honorable Dennis Cardoza  
The Honorable Jim Costa



## Westlands Water District

3130 N. Fresno Street, P.O. Box 6056, Fresno, California 93703-6056, (559) 224-1523, FAX (559) 241-6277

February 28, 2012

The Honorable Larry Kissell  
1632 Longworth HOB  
Washington, DC 20515

RE: H.R. 1837 – The Sacramento – San Joaquin Valley Water Reliability Act

Dear Mr. Kissell:

I am writing on behalf of Westlands Water District to urge that you support H.R. 1837, the Sacramento – San Joaquin Valley Water Reliability Act, when it is considered by the House of Representatives. Westlands is a California water district that serves irrigation water to an area of approximately 600,000 acres on the westside of the San Joaquin Valley in Fresno and Kings counties. Westlands is one of the most fertile, productive and diversified farming regions in the nation. Rich soil, a good climate, and innovative farm management have helped make the area served by Westlands one of the most productive farming areas in the San Joaquin Valley and the nation. Westlands farmers produce over 50 commercial fiber and food crops sold for the fresh, dry, and canned or frozen food markets; domestic and export. These crops have a value in excess of \$1 billion, and they are an important factor in ensuring that American families will continue to enjoy a food supply that is abundant, safe, and affordable. However, like most regions of the arid west, the production of these crops depends on the availability of water for irrigation.

Over the course of the last two decades, the implementation of the Endangered Species Act and the Central Valley Project Improvement Act has significantly limited the supply of water for family farmers throughout the Central Valley, but particularly on the westside of the San Joaquin Valley. These two laws have threatened the viability of irrigated agriculture in one of the most productive regions of this nation, and the enactment of H.R. 1837 would restore water supplies to this region and help sustain an agricultural economy that employs tens-of-thousands of people and helps feed the nation.

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Very truly yours,

  
Thomas W. Birmingham  
General Manager

cc: The Honorable Dennis Cardoza  
The Honorable Jim Costa



## Westlands Water District

3130 N. Fresno Street, P.O. Box 6056, Fresno, California 93703-6056, (559) 224-1523, FAX (559) 241-6277

February 28, 2012

The Honorable Mike McIntyre  
2133 Rayburn HOB  
Washington, DC 20515

RE: H.R. 1837 – The Sacramento – San Joaquin Valley Water Reliability Act

Dear Mr. McIntyre:

I am writing on behalf of Westlands Water District to urge that you support H.R. 1837, the Sacramento – San Joaquin Valley Water Reliability Act, when it is considered by the House of Representatives. Westlands is a California water district that serves irrigation water to an area of approximately 600,000 acres on the westside of the San Joaquin Valley in Fresno and Kings counties. Westlands is one of the most fertile, productive and diversified farming regions in the nation. Rich soil, a good climate, and innovative farm management have helped make the area served by Westlands one of the most productive farming areas in the San Joaquin Valley and the nation. Westlands farmers produce over 50 commercial fiber and food crops sold for the fresh, dry, and canned or frozen food markets; domestic and export. These crops have a value in excess of \$1 billion, and they are an important factor in ensuring that American families will continue to enjoy a food supply that is abundant, safe, and affordable. However, like most regions of the arid west, the production of these crops depends on the availability of water for irrigation.

Over the course of the last two decades, the implementation of the Endangered Species Act and the Central Valley Project Improvement Act has significantly limited the supply of water for family farmers throughout the Central Valley, but particularly on the westside of the San Joaquin Valley. These two laws have threatened the viability of irrigated agriculture in one of the most productive regions of this nation, and the enactment of H.R. 1837 would restore water supplies to this region and help sustain an agricultural economy that employs tens-of-thousands of people and helps feed the nation.

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Very truly yours,

  
Thomas W. Birmingham  
General Manager

cc: The Honorable Dennis Cardoza  
The Honorable Jim Costa



## Westlands Water District

3130 N. Fresno Street, P.O. Box 6056, Fresno, California 93703-6056, (559) 224-1523, FAX (559) 241-6277

February 28, 2012

The Honorable Henry Cuellar  
2463 Rayburn HOB  
Washington, DC 20515

RE: H.R. 1837 – The Sacramento – San Joaquin Valley Water Reliability Act

Dear Mr. Cuellar:

I am writing on behalf of Westlands Water District to urge that you support H.R. 1837, the Sacramento – San Joaquin Valley Water Reliability Act, when it is considered by the House of Representatives. Westlands is a California water district that serves irrigation water to an area of approximately 600,000 acres on the westside of the San Joaquin Valley in Fresno and Kings counties. Westlands is one of the most fertile, productive and diversified farming regions in the nation. Rich soil, a good climate, and innovative farm management have helped make the area served by Westlands one of the most productive farming areas in the San Joaquin Valley and the nation. Westlands farmers produce over 50 commercial fiber and food crops sold for the fresh, dry, and canned or frozen food markets; domestic and export. These crops have a value in excess of \$1 billion, and they are an important factor in ensuring that American families will continue to enjoy a food supply that is abundant, safe, and affordable. However, like most regions of the arid west, the production of these crops depends on the availability of water for irrigation.

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Very truly yours,

  
Thomas W. Birmingham  
General Manager

cc: The Honorable Dennis Cardoza  
The Honorable Jim Costa

**From:** Bernhardt, David L.  
**Sent:** Tuesday, February 28, 2012 2:22 PM  
**To:** Tom Birmingham  
**Subject:** Re: Letter to Kurt Schrader

Letters delivered.

David Bernhardt  


On Feb 28, 2012, at 2:27 PM, "Tom Birmingham" <[tbirmingham@westlandswater.org](mailto:tbirmingham@westlandswater.org)> wrote:

Karen,

Please put the attached letter on District letter head and send to David ASAP for delivery to Mr. Schrader's office.

Tom

<Ltr to Kurt Schrader.docx>

**From:** Jason Peltier

**Sent:** Tuesday, February 28, 2012 6:07 PM

**To:** T Birmingham (tbirmingham@westlandswater.org); Joe Findaro; David Bernhardt

**Subject:** Garamendi Dear Colleague

Letter to Colleagues: Protect States Water Rights

From: The Honorable John Garamendi

Date: 2/27/2012

Vote "Nay" or "Present" on H.R. 1837

I will be voting "Nay" on H.R. 1837. I urge you to either vote "Nay" or "Present" on H.R. 1837, because it would turn upside down 150 years of California water law and use the power of the federal government to preempt our state law and constitution.

Titles 1 and 2 of the bill rewrite complex federal water law without sufficient bipartisan collaboration, expert analyses or stakeholder engagement. Without Democrats and Republicans working cooperatively to address California's water challenges, no solution will be achieved.

H.R. 1837 is not broadly supported in California among urban, agricultural, conservationist, and recreational water stakeholders. Several notable groups have not taken a position on the legislation because it lacks consensus. Most of the state's leading editorial boards are opposed. H.R. 1837 is dividing us, instead of uniting us.

Water law is sacred in the western United States. If you represent the western states of Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, or Wyoming, then H.R. 1837 is especially alarming because it grants the federal government power to override a state's water law. A "Nay" or "Present" vote is a states' rights vote.

Furthermore, the Congressional Budget Office reports that "H.R. 1837 would impose intergovernmental mandates as defined in the Unfunded Mandates Reform Act (UMRA) by preempting state laws and requiring or prohibiting some activities related to water management and wildlife preservation. The bill would require the state of California to change how it manages a state system for storing and delivering water. It also would prohibit the state from restricting existing water rights in an effort to protect any species affected by the operations of the water projects in the state. Similarly, it would prohibit restrictions on water rights that are designed to protect, enhance, or restore the value of public water resources. Finally, the bill would preempt several other state laws related to water management and wildlife preservation."

H.R. 1837's unintended consequences are too great and its unanticipated uncertainties are too risky. What happens in California won't stay in California no matter what Title 5 of this bill says. This bill, if it ever becomes law, will ignite California's next water war and the fights will spread across the West.

Don't get roped into voting "Yea" on H.R. 1837 by leadership. Vote "Nay" or "Present", protect states' water rights and let those of us in California work together to reach solutions to our water challenges.

Sincerely,

JOHN GARAMENDI

Member of Congress

**From:** Nelson, Damon

**Sent:** Wednesday, February 29, 2012 5:42 AM

**To:** Thomas Birmingham (tbirmingham@westlandswater.org); 'Bernhardt, David L.' (DBernhardt@BHFS.com)

**Subject:** FW: State Preemption on the floor today?

**Attachments:** California Water Law (Simplified) and the Sacramento-San Joaquin Valley Water Reliability Act.pdf

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**From:** Nelson, Damon

**Sent:** Wednesday, February 29, 2012 7:40 AM

**Subject:** State Preemption on the floor today?

You will hear a lot of blustering from the Democrats today (who will seem to have a new found respect for State's Rights) about state preemption and State's Rights. They will claim that H.R. 1837 tramples on California's Constitution and state law.

What the Democrats will fail to mention are the FACTS – the inconvenient truth!

Attached is a document that will explain.

Also, the following organizations who are strong proponents of State's Rights have endorsed the bill.

Americans for Limited Government; National Taxpayers Union; Americans for Tax Reform; Citizens Against Government Waste; American Land Rights Association

Moreover, here is a list of State elected leaders who support the bill. If this bill violates State's Rights, then why would State elected leaders support the bill?

Senator Jean Fuller; Senator Bill Emmerson; Senator Anthony Cannella; Senator Joel Anderson; Senator Bob Huff; Senator Tom Berryhill; Senator Mimi Walters; Senator Tony Strickland; Senator Mark Wyland; Senator Bob Dutton; Senator Tom Harman; Senator Sharon Runner; Senator Ted Gaines; Senator Doug LaMalfa; Minority Leader Connie Conway; Assemblyman David Valadao; Assemblyman Jeff Miller; Assemblywoman Diane Harkey; Assemblywoman Shannon Grove; Assemblyman Jim Silva; Assemblyman Brian Jones; Assemblyman Cameron Smyth; Assemblyman Katcho Achadjian; Assemblyman Donald Wagner; Assemblyman Mike Morrell; Assemblyman Allan Mansoor; Assemblyman Brian Nestande; Assemblyman Steve Knight; Assemblywoman Linda Halderman; Assemblyman Paul Cook; Assemblyman Martin Garrick; Assemblyman Curt Hagman

Here is the entire list of support.

[http://nunes.house.gov/UploadedFiles/Support for the Sacramento-San Joaquin Valley Water Reliability Act.pdf](http://nunes.house.gov/UploadedFiles/Support%20for%20the%20Sacramento-San%20Joaquin%20Valley%20Water%20Reliability%20Act.pdf)

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Damon Nelson  
Deputy Chief of Staff & Legislative Director  
Congressman Devin Nunes  
Office: (202) 225-2523

*Office Mission* To ensure our constituents and all Americans live free and prosperous lives in a healthy and safe environment by serving, communicating, protecting and representing them in a professional and caring manner.



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# **Sacramento-San Joaquin Valley Water Reliability Act**

## **Prior Preemption of California Water Law**

### **SUMMARY**

At the invitation of the State of California, the Central Valley Project (CVP) was built by the Federal government nearly seven decades ago. At that time, the State of California relinquished its rights to any water produced by the federal project. Since 1986, at the request of the State of California and by federal law, the Central Valley Project and the State Water Project are required to operate in coordination with one another. Therefore, any action taken by the federal government will impact state operations and any action by the state will impact federal operations. This is not a state preemption – it is required coordination. Furthermore, the Bay-Delta Accord signed in 1994 by California Governor Pete Wilson and Clinton Administration Secretary of the Interior Bruce Babbitt outlines explicit operations for the Sacramento and San Joaquin Rivers Delta. State compliance with the Accord cannot be labeled federal preemption when California is simply being held to a previous agreement - one that had strong bipartisan support. Because the Central Valley Project and the State Water Project are unique and are not replicated anywhere else in the country, the actions prescribed in H.R. 1837 will not set a precedent that can be applied to other Reclamation projects.

Finally, H.R. 1837 is an exercise of Congress' rights under Section 1 & 5 of the Constitution's 14<sup>th</sup> Amendment to enact legislation to ensure that private property is not taken without due process. Water can be acquired by federal and state agencies for the benefit of fish, but it will have to be acquired in a manner consistent with the just compensation clause of the Constitution's 5<sup>th</sup> Amendment.

### **Historical Background**

Some have expressed concerns with H.R. 1837 (Nunes, McCarthy and Denham) on the grounds that the legislation would preempt the application of state water and environmental law. These concerns ignore the history of preemption of California law as it applies to operations of the federal Central Valley Project (CVP) and the California State Water Project (SWP). H.R. 1837's preemption of California law recognizes this history of preemption so that all water users have a reliable water supply by protecting these property rights from federal and state regulators. As outlined below, H.R. 1837 is a response to a truly unique circumstance in the West. The bill, as amended, protects water users in northern and southern California and is the product of lengthy discussions between diverse water interests.

Unlike any other western water project, the CVP and SWP is a legally and operationally integrated operation. This unique circumstance was created to resolve uncertainty in the 1980's over whether the CVP or SWP would meet water quality standards in the Sacramento-San Joaquin Bay Delta. This uncertainty existed because it was the federal government's position that under California's





water rights priority system, the SWP had to meet water quality objectives before such conditions could be imposed on the CVP.

To avoid the potential implications of the application of these state water quality and priority of water rights laws to the SWP, the State of California proposed the sharing of obligations to meet such standards through the coordinated operations of the two projects. As a result, in 1986, Congress passed Public Law 99-546, which authorized the federal Interior Secretary to execute and implement the “Agreement Between the United States of America and the Department of Water Resources of the State of California for Coordinated Operations of the Central Valley Project and the State Water Project,” (“COA”). Although it is not expressed in terms of preemption, congressional approval of COA was in essence a preemption of California’s law as it pertains to the priority of state water rights because it integrated the two projects and their regulatory responsibilities into one.

The COA and Public Law 99-546 also form the basis for federal ESA preemption on the integrated CVP/SWP system. If COA did not exist, then the SWP would not be subject to the federal ESA’s biological opinions on fish species. However, as a result of COA, a single federal biological opinion now impacts both projects due to the fact they are integrated and operated as one unit. In this case, a federal law is superseding state law due to the State’s original preemption needs on COA and a subsequent congressional authorization.

The existence of COA has been used to justify the imposition by Congress of other obligations on the State of California. The Central Valley Project Improvement Act (CVPIA), Public Law 102- 575, which was authored by Representative George Miller (D-CA), is replete with such state preemptions. For example, CVPIA required 800,000 acre-feet of CVP yield to be used for fish and wildlife enhancement and specified quantities of water for wetlands for waterfowl habitat. These uses were not consistent with water rights appropriated pursuant to permits issued by the State Water Resources Control Board (SWRCB) under Water Code section 1700. However, these CVPIA actions (3406(b)(2) and 3406(d)) were interpreted by then-Deputy Interior Secretary John Garamendi to require the use of CVP water for these purposes even though the water right permits issued by the SWRCB did not authorize the use of water for those purposes.

The CVPIA also preempted flows on the Trinity River in northern California. Normally, minimum flow requirements for streams below a dam are established by the SWRCB using criteria established by state law. The CVPIA’s Section 3406(b)(23) ignored this process and these criteria. This provision prescribed specific minimum flow requirements (340,000 acre-feet) for the Trinity River, described a process for the Secretary of the Interior to confer with the Hoopa Valley Tribe concerning new minimum flow requirements for the Trinity River, and provided that “[i]f the Secretary and the Hoopa Valley Tribe concur in these recommendations, any increase to the minimum Trinity River instream fishery releases established under this paragraph and the operating criteria and procedures referred to in subparagraph (A) shall be implemented accordingly.” In other words, section 3406(b)(23) usurped the authority of the state to establish minimum flow requirements for the Trinity River by prescribing minimum flow and by giving that authority to the Secretary and the Hoopa tribe. Because the Secretary and the Hoopa tribe concurred on minimum flow requirements for the Trinity River, those flows must be released regardless of what the State of California thinks and regardless of what would have been done under state law.





There is a clear history of federal preemption over California water and environmental law. In one case, the State requested preemption (COA). In other cases, the very people (George Miller and John Garamendi) who are now opposing H.R. 1837 under the guise of state water rights have a repeated history of preempting state water law (COA and CVPIA). Even today, while they oppose the bill, they are cosponsors of H.R. 3398, the Klamath Basin Economic Restoration Act . This far-reaching bill codifies a settlement agreement that allows for pre-emption on California and Oregon water law. For example, the Klamath settlement being codified by H.R. 3398 will mean that Congress is telling the State of Oregon and California specifically how to allocate water (similar to the above Trinity example). If the two states ever wanted to change those allocations, they simply could not since congressional approval of the settlement pre-empted them from doing so.

The California water system is in a unique preemption circumstance. It is a unique system that is rife with preemptions thanks to prior congressional actions. There simply is not another situation in the West where, at the request of the state, the federal government and the state government are operating, in coordination, two major water projects to share responsibilities to meet environmental standards imposed under federal and state law. Nor is there another situation in the west where Congress has, without any apparent reservation, imposed obligations on the state government and preempted state law as it applies to a federal water project.

If Congress does not include the preemptions in H.R. 1837, only those water users who depend on the federal CVP would be protected from water shut-offs related to ESA and other laws. This protection, however, would force the federal government and the State to look for additional water sources to meet environmental water needs. Since the CVP/SWP are integrated, the first target would those who depend on the SWP. If the SWP is protected under the bill, then the regulators would then seek to take water from other water users, namely from areas-of-water-origin in northern California. As a result, H.R. 1837 protects water rights by prohibiting this from happening at the state level and recognizes the unique nature of an already preempted water system.





**From:** Nelson, Damon

**Sent:** Wednesday, February 29, 2012 6:46 AM

**To:** Thomas Birmingham (tbirmingham@westlandswater.org); 'Bernhardt, David L.' (DBernhardt@BHFS.com); Jason Peltier (jpeltier@westlandswater.org)

**Subject:** Orange County Record: by Rep. Ed Royce

## **Orange County Register**

By ED ROYCE / Republican congressman representing Fullerton, other parts of North Orange County

"Human beings, as a species, have no more value than slugs."

— John Davis, editor, Earth First! Journal

While "mainstream" environmentalists may claim Mr. Davis does not represent them, actions taken in California on behalf of this movement increasingly resemble a world envisioned by Mr. Davis.

In just the past decade, millions of acres of land and trillions of gallons of water have been off-limits because of environmental mandates. Farmers have been prosecuted for disturbing the habitat of the Kangaroo rat, levees weren't maintained because doing so would harm the Elderberry Longhorn beetle, and a public hospital even had to be moved because of the presence of the Delhi Sands Flower-Loving fly. These fights, however troubling, pale in comparison to the most damaging offensive by the hard-core environmental movement, which came in defense of the Delta smelt, a three-inch fish.

Armed with powerful allies in Washington, those on the extreme end of the movement were able to severely restrict pumping throughout the California aqueduct system because, they claim, the pumps were depleting the smelt population. As is so often the case, the benefits were greatly oversold, and the costs were severely understated.

Despite claims by extremists, millions of dollars of research has shown numerous factors contributed to the decline in the smelt population, not simply the pumps. Additionally, the negative impact of slower pumps on California's economy was largely overlooked.

Northern California contains over two-thirds of the state's water resources and Southern California is home to two-thirds of the state's residents. As a result, millions of residents and thousands of farmers have long relied on this critical delivery system to meet their water demands. When the aqueduct pumps slowed under court orders and opinions issued by the Obama administration, devastation ensued. The worst of it hit in 2010. Over a million acre-feet of water were lost, thousands of jobs were destroyed, and hundreds of thousands of fertile acres were unnecessarily made fallow. The unemployment rates in some Central Valley towns reached toward 40 percent. Those signs along I-5 through the Central Valley told the story; "No Water = No jobs," "Food grows where water flows," and my personal favorite: "New Dust Bowl, Created by Congress."

Despite their powerful friends, the extremists were dealt a blow in late 2010, when a federal judge ruled that those ill-conceived biological opinions issued by the administration were unlawful and illogical. As a result, people who rely on the waterway have seen pumping restrictions eased.

While this was a step in the right direction, problems still exist, and no one knows where the Obama administration will go from here. Given recent history, one might bet it will err on the side of the smelt and against the interests of California.

However, legislation set to be considered by the House this week would bring some much-needed sanity back to this process. Rep. Devin Nunes' bill will ensure water access will not be restricted on the whims of the fringe environmental movement. By restoring water deliveries to the levels agreed upon in the 1994 Bay Delta Accords between California

and the federal government, this bill could create 30,000 jobs and save millions of acre-feet of water, which has been sent to the ocean because of overzealous environmental regulations.

However, this administration has proved willing to ignore Congress and bend the rules to appease its radical allies. The only guaranteed solution to the Delta smelt problem, as with so many other problems we face, is to ensure this president is retired in November.

FOLLOW US @OCRegLetters

**From:** Jason Peltier

**Sent:** Wednesday, February 29, 2012 11:15 AM

**To:** Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLoyd Fryer; 'Martin McIntyre'; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** FW: House Floor///Miller

I love George DEFENDING BDCP....

---

**From:** Jason Peltier [mailto:jpeltier@westlandswater.org]

**Sent:** Wednesday, February 29, 2012 10:00 AM

**Subject:** House Floor

<http://www.c-span.org/Live-Video/C-SPAN/>

**From:** Tom Birmingham  
**Sent:** Wednesday, February 29, 2012 5:37 PM  
**To:** 'Bernhardt, David L.'; joe.findaro@akerman.com; 'Jason Peltier'  
**Subject:** FW: Thank You

I sent the following immediately after the vote on passage:

---

**From:** Tom Birmingham [<mailto:tbirmingham@westlandswater.org>]  
**Sent:** Wednesday, February 29, 2012 6:35 PM  
**To:** Weaver, Kiel; Nelson, Damon; Lombardi, Kyle; Glenn, Kristen; Birman, Igor; Larrabee, Jason; Pederson, Spencer  
**Cc:** 'Don Peracchi'; 'Daniel Errotabere'; 'Donald Devine'; 'Frank Coelho, Jr.'; [gesajian@westlandswater.org](mailto:gesajian@westlandswater.org); 'Larry Enos'; 'Todd Neves'; 'Sarah Clark Woolf'; [asano@westlandswater.org](mailto:asano@westlandswater.org)  
**Subject:** Thank You

Lady and Gentlemen,

I hope that I am the first to say thank you for your tremendous work on the passage of HR 1837. I watched the entire proceedings, and it the quality of argument in favor of the bill was spectacular. It was very apparent that each of you had worked diligently to prepare your respective bosses.

A more formal thank you letter will be sent from the President of Westlands to the Members, but I wanted to say thank you on behalf of the people who work and live in the Valley. I realize that I have used numerous superlatives in this email, but each is warranted.

Thank you,  
Tom

**From:** Bernhardt, David L.  
**Sent:** Wednesday, February 29, 2012 5:43 PM  
**To:** Tom Birmingham  
**Subject:** RE: Thank You

Great.

---

**From:** Tom Birmingham [<mailto:tbirmingham@westlandswater.org>]  
**Sent:** Wednesday, February 29, 2012 7:37 PM  
**To:** Bernhardt, David L.; [joe.findaro@akerman.com](mailto:joe.findaro@akerman.com); 'Jason Peltier'  
**Subject:** FW: Thank You

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**Sent:** Wednesday, February 29, 2012 6:35 PM  
**To:** Weaver, Kiel; Nelson, Damon; Lombardi, Kyle; Glenn, Kristen; Birman, Igor; Larrabee, Jason; Pederson, Spencer  
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Thank you,  
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**From:** Jason Peltier

**Sent:** Wednesday, March 7, 2012 3:10 PM

**To:** Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLoyd Fryer; 'Martin McIntyre'; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** Letter to Jerry from North Delta coalition

13 pages: <http://library.constantcontact.com/download/get/file/1102037578231-139/Group+Ltr+to+Meral+02+29+12.pdf>

**From:** Jason Peltier

**Sent:** Monday, March 12, 2012 10:50 AM

**To:** 'T Birmingham (tbirmingham@westlandswater.org)'; 'Allison Dvorak Febbo'; 'Ara Azhderian'; 'B Walthall'; 'BJ Miller'; 'Brenda Burman'; 'Byron Buck'; 'Carolyn Jensen'; 'Chris Beale'; 'Clare Foley'; 'Cliff Schulz'; 'Curtis Creel'; 'D Nelson'; 'Dan Keppen'; 'David Bernhardt'; 'Ed Manning'; frances.mizuno@sldmwa.org; 'Gayle Holman'; 'Greg Zlotnick'; 'Joe Findaro'; 'Jon Rubin'; 'Kear,Adam C'; 'Laura King Moon'; 'Laura Simonek'; 'LLoyd Fryer'; 'Martin McIntyre'; 'Mike Henry'; 'Mike Wade'; 'Neudeck,Randall D'; 'Philp,Thomas S'; 'Rodriguez, Larry'; 'Roger Patterson'; 'Rose Schlueter'; 'Sheila Greene'; 'Steve Arakawa'; 'Sue Ramos'; 'Terry Erlewine'; 'Tom Boardman'; 'Tom Glover'; 'Tom Mongan'; 'Valerie Connor'

**Subject:** More Fun

A testimonial from Sockton's new lobbyist:

*"Hopcraft Communications is an essential component of a successful strategy to effect political change on issues and laws in the state of California."*—  
Donne Brownsey, Senior Vice President, Sacramento Advocates

---

**From:** Jason Peltier [mailto:jpeltier@westlandswater.org]

**Sent:** Monday, March 12, 2012 10:44 AM

**To:** 'T Birmingham (tbirmingham@westlandswater.org)'; 'Allison Dvorak Febbo'; 'Ara Azhderian'; 'B Walthall'; 'BJ Miller'; 'Brenda Burman'; 'Byron Buck'; 'Carolyn Jensen'; 'Chris Beale'; 'Clare Foley'; 'Cliff Schulz'; 'Curtis Creel'; 'D Nelson'; 'Dan Keppen'; 'David Bernhardt'; 'Ed Manning'; frances.mizuno@sldmwa.org; 'Gayle Holman'; 'Greg Zlotnick'; 'Joe Findaro'; 'Jon Rubin'; 'Kear,Adam C'; 'Laura King Moon'; Jason Peltier; 'Laura Simonek'; 'LLoyd Fryer'; 'Martin McIntyre'; 'Mike Henry'; 'Mike Wade'; 'Neudeck,Randall D'; 'Philp,Thomas S'; 'Rodriguez, Larry'; 'Roger Patterson'; 'Rose Schlueter'; 'Sheila Greene'; 'Steve Arakawa'; 'Sue Ramos'; 'Terry Erlewine'; 'Tom Boardman'; 'Tom Glover'; 'Tom Mongan'; 'Valerie Connor'

**Subject:** RE: truly sad that their strongest argument is rhetoric rooted in bigotry toward those who live, work and farm on the Westside.

Info on their press contact fella:



## About Us

Steve Hopcraft grew up in Rhode Island in the sixties, inspired by civil rights and antiwar leaders, he helped organize protests during high school and at the University of Rhode Island (URI).

After graduating from URI, and spending a year in postgraduate study at the University of Maryland, Steve moved to Berkeley in 1973, helping to lead a successful two-year rent strike. Steve left Berkeley for the Central Valley in August 1975, intending to spend a couple of weeks working on the United Farm Worker's first-ever farmworkers' union representation elections. Instead, Steve spent more than two years there, learning to speak Spanish in the fields while working as a bilingual paralegal and organizer. The growers and the Teamsters Union actively, sometimes violently, opposed the UFW, firing and harassing workers, and intimidating union leaders and staff. Steve later became Regional Director for the UFW's statewide Proposition 14 campaign.

In 1977, Steve left the UFW for Sacramento and a position as a supervisor of California community organizers for the U.S. government's Volunteers in Service to America (VISTA) program. In 1978, Steve became legislative representative for CHAIN, California's tenants' rights group, helping lead post-Prop. 13 rent control and tenants' protection campaigns. Steve was elected CHAIN's president, and in 1980, while being vastly outspent, co-managed a landmark ballot measure campaign, defeating a landlord-sponsored repeal of local rent controls.

In 1982, Steve took a position in the State Capitol as press aide to Leo McCarthy, who was elected lieutenant governor that year. As Lieutenant Governor McCarthy's press secretary, Steve worked with the statewide media on issues and elections, including the 1988 presidential race where Steve served as the California Press Secretary during the presidential and senatorial elections.



During this time, Steve earned a Masters Degree in Communications Studies at Sacramento State, studying the theoretical basis for his advocacy work.



Following the 1988 election, Steve founded Stephen K. Hopcraft Communications Consulting. Hopcraft Communications principally serves nonprofit and public interest organizations, including labor unions, and state ballot measures, and public education campaigns.

### Our Mission

Our mission has been to do good things, with good people and have a good time doing it. Our first client was the Oceanic Society, an ocean-conservation organization. In twenty years Hopcraft Communications has helped dozens of progressive policy efforts and nonprofit groups. We bring experience and enthusiasm to our progressive issues advocacy. We've earned a reputation for dedicated, creative work. A California political newsletter wrote that the media cover Hopcraft's clients "in self-defense" – due to our dogged persistence in seeking media coverage and public support.

Raised on student protests, trained by the farmworkers' union's best organizers, and working for thirty years on California campaigns, Steve brings a diverse arsenal of skills to his clients' communications challenges. Let Hopcraft Communications give voice to your cause.

---

**From:** Jason Peltier [<mailto:jpeltier@westlandswater.org>]

**Sent:** Monday, March 12, 2012 10:38 AM

**To:** T Birmingham (tbirmingham@westlandswater.org); Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; [frances.mizuno@sldmwa.org](mailto:frances.mizuno@sldmwa.org); Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLOYD Fryer; 'Martin McIntyre'; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** truly sad that their strongest argument is rhetoric rooted in bigotry toward those who live, work and farm on the Westside.

Members of Delta Coalition discuss their opposition to "any peripheral canal or tunnel" sending Sacramento-San Joaquin Delta water "directly to corporate agribusiness," say urban water districts are "working hard to conserve" while "top 1%" of "agribusiness has its eyes fixed on draining the Delta." 8:30 a.m., Outside Rm. 112. Contact: Steve Hopcraft 916 956 4592.

Listed speakers: Stockton Mayor Ann Johnston; Barbara Barrigan-Parilla, Restore the Delta.

Source: Today's Capitol Morning Report

**From:** Jason Peltier

**Sent:** Monday, March 19, 2012 6:34 AM

**To:** T Birmingham (tbirmingham@westlandswater. org); Curtis Schmutte; Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLoyd Fryer; 'Martin McIntyre'; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** River up and muddy. Georgiana barrier

**Attachments:** photo.jpg; photo.jpg; photo.jpg; photo.jpg; photo.jpg; photo.jpg; photo.jpg

**From:** Karen Clark

**Sent:** Monday, March 19, 2012 12:46 PM

**To:** Tony Coelho; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Mike Burns; Susan Ramos

**Subject:** PR/Legislation Conf. Call

Everyone,

Previously, I sent you an email stating that the PR/Legislation conference call scheduled for Friday, March 30 at 7:30 a.m. had been cancelled. Please disregard that email and calendar that item. Tom will be back from Washington DC and will give the group an update.

If you have any questions, please contact me at [REDACTED]

Sincerely,

~Karen

*Karen Clark*

*Executive Assistant to Thomas W. Birmingham*

*Westlands Water District*

*P.O. Box 6056*

*Fresno, CA 93703*

*(c) [REDACTED]*

*(f) 559.241.6277*

*[kclark@westlandswater.org](mailto:kclark@westlandswater.org)*

**From:** Carmela McHenry  
**Sent:** Monday, March 19, 2012 1:10 PM  
**To:** 'Karen Clark'  
**Subject:** RE: PR/Legislation Conf. Call

Thanks, Karen. I've updated the calendars for my folks on the 30<sup>th</sup>.

Hope your Monday is going well and enjoy the rest of your day. ☺

Best,

Carmela

*Carmela McHenry*

(Direct) 916-498-7711

(Fax) 916-448-4923

---

**From:** Karen Clark [mailto:kclark@westlandswater.org]  
**Sent:** Monday, March 19, 2012 12:46 PM  
**To:** Tony Coelho; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Michael Burns; Susan Ramos  
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Sincerely,

~Karen

*Karen Clark*  
*Executive Assistant to Thomas W. Birmingham*  
*Westlands Water District*  
*P.O. Box 6056*  
*Fresno, CA 93703*  
(c) [REDACTED]  
(f) 559.241.6277  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Karen Clark  
**Sent:** Monday, March 19, 2012 1:10 PM  
**To:** Carmela McHenry  
**Subject:** RE: PR/Legislation Conf. Call

Thanks, Carmela! :)

~Karen

*Karen Clark*  
*Executive Assistant to Thomas W. Birmingham*  
*Westlands Water District*  
*P.O. Box 6056*  
*Fresno, CA 93703*  
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(f) 559.241.6277  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

-----Original Message-----

**From:** Carmela McHenry [mailto:cmchenry@ka-pow.com]  
**Sent:** Monday, March 19, 2012 1:10 PM  
**To:** 'Karen Clark'  
**Subject:** RE: PR/Legislation Conf. Call

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Carmela

*Carmela McHenry*  
(Direct) 916-498-7711  
(Fax) 916-448-4923

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**Sent:** Monday, March 19, 2012 12:46 PM  
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*(f) 559.241.6277*  
[\*kclark@westlandswater.org\*](mailto:kclark@westlandswater.org)

**From:** Jason Peltier

**Sent:** Wednesday, March 21, 2012 9:14 AM

**To:** T Birmingham (tbirmingham@westlandswater.org); Jon Rubin; Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Kear,Adam C; Laura King Moon; Laura Simonek; LLoyd Fryer; 'Martin McIntyre'; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** I am speechless

## Water agency secures \$38 million for project

Score a big win for the Woodland-Davis Clean Water Agency.

The state has agreed to split the cost with the federal government to fund almost the entire joint intake facility on the Sacramento River, a boost that could shave millions off the cost of the umbrella surface water project to Davis and Woodland taxpayers.

The water intake structure bears an estimated price tag of \$39 million.

The intake plays an integral role in the surface water project as a whole, which will tap water from the Sacramento River, treat it and pipe it to the two cities. The project's overall cost is about \$330 million.

According to Stephen Souza, a Davis City Councilman and agency board member, the state and federal governments will each commit approximately \$19 million to pay for 95 percent of the intake structure. The money comes from the Central Valley Project Restoration Fund, which allocates funds to projects that restore habitats for fish and other wildlife.

The current intake facility, which is owned by Reclamation District 2035, does not have adequate screening to protect fish.

"The California Natural Resources Agency, as well as several of our departments — including the Department of Fish and Game and the Department of Water Resources — are committed to completing these projects," wrote John Laird, California Natural Resources Commission secretary, in a letter to the U.S. Bureau of Reclamation. That department oversees the allocation of the money from the Central Valley Project Restoration Fund.

Kim Floyd, public outreach manager for the Woodland-Davis Clean Water Agency, wrote in an email Monday to The Enterprise that the correspondence is "one of the strongest letters I have seen from the state, and it bodes well for the potential for federal and state funding for construction."

The last step in the process to secure the funds for the intake structure is to ask Congress to approve President Obama's fiscal year 2013 budget with more than \$11 million dedicated to the Bureau of Reclamation's Anadromous Fish Screen Program and the bureau's water and related resources account.

In early March, several agency members — including Souza, general manager Dennis Diemer and Woodland City Councilman Bill Marble — flew to Washington, D.C., to urge congressmen to do just that, in addition to lobby for funding for other aspects of the surface water project.

According to Diemer, every indication he saw pointed to the agency receiving the necessary funding for the intake facility.

“We don’t have the money in hand, but we have the verbal commitment from all the folks that are in charge of the projects who control the funds,” Diemer said Monday.

“We feel good that everywhere we went and everybody we talked to, there were no issues or concerns that the construction funding would be there.”

In addition to commitments from the federal and state governments to fund the intake structure, the agency board members brought home high hopes for other grants that would fund other aspects of the water project.

Agency members met with more than a dozen congressman, senators and representatives of grant programs to ask for more help to pay for the project.

“We’re pursuing every option that we can think of and I would say if the public has any idea of another option they ought to let us know and we will pursue it, too,” Marble said at the agency’s board meeting Thursday. “I think we are working hard to get federal dollars into this project and we are working hard to get state dollars.”

The Clean Water Agency delegation met with representatives of the Environmental Protection Agency’s Drinking Water State Revolving Fund, the Economic Development Assistance Program, the environmental infrastructure department of the U.S. Army Corps of Engineers, the Bureau of Reclamation and WaterSMART.

They also met with representatives of Cal/EPA, Integrated Regional Water Management, Clean Water State Revolving Fund, Consolidated Grants Program, Infrastructure State Revolving Fund and the California Department of Public Health.

Souza believes there are a lot of sources to tap for additional funding.

“We are 120,000 people between our two cities and the cost is the largest you can see on a per-capita basis, so we need help to find sources for funding,” Souza said.



**From:** Jason Peltier

**Sent:** Wednesday, March 21, 2012 9:36 AM

**To:** T Birmingham (tbirmingham@westlandswater.org); Jon Rubin; Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Kear,Adam C; Laura King Moon; Laura Simonek; LLoyd Fryer; 'Martin McIntyre'; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** RE: I am speechless

What does this diversion have to do with the construction/operation of the CVP? [Conaway has their own right and are selling some to Davis/Woodland]

How is this a current salmon priority when the fish are migrating little if any ag diversions are occurring?

The RF is stuck in the past. A few years ago I recall there was thinking in the biological community that with 80% of the diversion capacity on the Sac river screened that it was time to de-prioritize screening.

Galling to me that CVP farmer money going to benefit these cities when they could care less about the realities we are facing.

Every time I bring up the need to modernize RF priorities and put some RF \$ into Delta projects, BOR ignores the notion and sticks to protecting their little empires and FTEs. I am sure they will be resistant to seeing our RF \$ payments being directed at anything that actually benefits our customers.

Etc.

---

**From:** Patterson,Roger K [mailto:RPatterson@mwdh2o.com]

**Sent:** Wednesday, March 21, 2012 9:17 AM

**To:** 'Jason Peltier'

**Subject:** RE: I am speechless

That's been the plan for some time. This intake was on the list of priorities for the screening program.

---

**From:** Jason Peltier [mailto:jpeltier@westlandswater.org]

**Sent:** Wednesday, March 21, 2012 9:14 AM

**To:** T Birmingham (tbirmingham@westlandswater.org); Jon Rubin; Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Burman,Brenda W; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Kear,Adam C; Laura King Moon; Simonek,Laura J; LLoyd Fryer; 'Martin McIntyre'; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Patterson,Roger K; Rose Schlueter; Sheila Greene; Arakawa,Stephen N; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

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Agency members met with more than a dozen congressman, senators and representatives of grant programs to ask for more help to pay for the project.

“We’re pursuing every option that we can think of and I would say if the public has any idea of another option they ought to let us know and we will pursue it, too,” Marble said at the agency’s board meeting Thursday. “I think we are working hard to get federal dollars into this project and we are working hard to get state dollars.”

The Clean Water Agency delegation met with representatives of the Environmental Protection Agency’s Drinking Water State Revolving Fund, the Economic Development Assistance Program, the environmental infrastructure department of the U.S. Army Corps of Engineers, the Bureau of Reclamation and WaterSMART.

They also met with representatives of Cal/EPA, Integrated Regional Water Management, Clean Water State Revolving Fund, Consolidated Grants Program, Infrastructure State Revolving Fund and the California Department of Public Health.

Souza believes there are a lot of sources to tap for additional funding.

“We are 120,000 people between our two cities and the cost is the largest you can see on a per-capita basis, so we need help to find sources for funding,” Souza said.

---

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**From:** Karen Clark

**Sent:** Friday, March 23, 2012 8:23 AM

**To:** Tony Coelho; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Mike Burns; Susan Ramos

**CC:** Carmela McHenry; Karen Clark

**Subject:** Meeting in Sacramento

All,

As discussed on today's conference call, please email me your availability for a meeting in Sacramento to discuss a variety of political issues on April 2, 3 and 4. Those of you on the East Coast will be participating by conference call. I'm guessing that the meeting will last approximately 2 hours.

Sincerely,

~Karen

*Karen Clark*

*Executive Assistant to Thomas W. Birmingham*

*Westlands Water District*

*P.O. Box 6056*

*Fresno, CA 93703*

*(c) [REDACTED]*

*(f) 559.241.6277*

*[kclark@westlandswater.org](mailto:kclark@westlandswater.org)*

**From:** Bernhardt, David L.  
**Sent:** Friday, March 23, 2012 8:37 AM  
**To:** Karen Clark  
**Subject:** Re: Meeting in Sacramento

I'll make the time you pick work.

David Bernhardt  
202-872-5286  
202-████-████ (cell)

On Mar 23, 2012, at 11:22 AM, "Karen Clark" <[kclark@westlandswater.org](mailto:kclark@westlandswater.org)> wrote:

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*(c) ██████████*  
*(f) 559.241.6277*  
*[kclark@westlandswater.org](mailto:kclark@westlandswater.org)*

**From:** Jason Peltier  
**Sent:** Friday, March 23, 2012 8:38 AM  
**To:** 'Karen Clark'  
**Subject:** RE: Meeting in Sacramento

4/2 conflict most of the day with levee conference

4/3 OK

4/4 OK except 10-12 [Cowin meeting]

---

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**Sent:** Friday, March 23, 2012 8:23 AM  
**To:** Tony Coelho; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Mike Burns; Susan Ramos  
**Cc:** Carmela McHenry; Karen Clark  
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[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Jason Peltier  
**Sent:** Friday, March 23, 2012 9:06 AM  
**To:** 'Karen Clark'  
**Subject:** RE: Meeting in Sacramento

Correction: 4/4 is Large Delta projects meeting 10-12 not Cowin.

---

**From:** Jason Peltier [mailto:jpeltier@westlandswater.org]  
**Sent:** Friday, March 23, 2012 8:38 AM  
**To:** 'Karen Clark'  
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**Cc:** Carmela McHenry; Karen Clark  
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(c) [REDACTED]  
(f) 559.241.6277  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Carmela McHenry  
**Sent:** Friday, March 23, 2012 9:51 AM  
**To:** 'Karen Clark'  
**Subject:** RE: Meeting in Sacramento

Hi Karen:

Happy Friday! Hope you are doing well.

At your request --- As of today (3/23), the following works for KP for the meeting, in Sacramento, to discuss a variety of political issues:

April 2 -- any time between 10:30 AM to 2:30 PM

April 3 -- any time between 9 AM to 1 PM

April 4 -- any time between 9 AM to 11 AM and/or 1:30 to 5 PM

If you have any questions and/or need for me to HOLD a specific day/time on our calendars, please let me know.

Thank you.

*Carmela McHenry*

(Direct) 916-498-7711

(Fax) 916-448-4923

---

**From:** Karen Clark [mailto:kclark@westlandswater.org]

**Sent:** Friday, March 23, 2012 8:23 AM

**To:** Tony Coelho; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Michael Burns; Susan Ramos

**Cc:** Carmela McHenry; Karen Clark

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*Fresno, CA 93703*

(c) [REDACTED]

(f) 559.241.6277

[kclark@westlandswater.org](mailto:kclark@westlandswater.org)



**From:** Carmela McHenry  
**Sent:** Friday, March 23, 2012 9:58 AM  
**To:** 'Karen Clark'  
**Subject:** RE: Meeting in Sacramento

Hi Karen:

I forgot to mention that **April 4<sup>th</sup> is preferably** the date that works for everyone from KP to meet "in person". April 2<sup>nd</sup> and 3<sup>rd</sup>, Mike Burns will be out of the office... but he can call-in if those two days only work for the majority.

Sorry for the confusion.

Thanks.

*Carmela McHenry*  
(Direct) 916-498-7711  
(Fax) 916-448-4923

---

**From:** Carmela McHenry  
**Sent:** Friday, March 23, 2012 9:51 AM  
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**Sent:** Friday, March 23, 2012 8:23 AM  
**To:** Tony Coelho; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Michael Burns; Susan Ramos  
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*(f) 559.241.6277*  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Karen Clark

**Sent:** Friday, March 23, 2012 10:46 AM

**To:** Karen Clark; Tony Coelho; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Mike Burns; Susan Ramos

**CC:** Carmela McHenry

**Subject:** Meeting in Sacramento

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Call-in information for those of you calling in is: 800-████-████ pass code █████

KP (Carmela) will be the call leader (enter █████ after the number above when prompted).

If you have any questions, please feel free to contact me at █████

Sincerely,

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*(c) █████*

*(f) 559.241.6277*

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**From:** Karen Clark [mailto:kclark@westlandswater.org]

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**To:** 'Tony Coelho'; 'Carmela McHenry'; 'Carolyn Jensen'; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Jason Peltier'; 'Joe Findaro'; 'Mike Burns'; 'Susan Ramos'

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Fresno, CA 93703

(c) [REDACTED]

(f) 559.241.6277

[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Carmela McHenry  
**Sent:** Friday, March 23, 2012 11:24 AM  
**To:** 'Karen Clark'  
**Subject:** RE: Meeting in Sacramento

Hi Karen:

I've reserved conference room A, from 9-11 AM, for this meeting on the 4<sup>th</sup>. There will be coffee and bottled water in the room for the meeting.

If you want me to make arrangements for breakfast pastries and fruit, please let me know.

Thanks.

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[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Karen Clark  
**Sent:** Friday, March 23, 2012 1:22 PM  
**To:** Carmela McHenry  
**Subject:** RE: Meeting in Sacramento

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Hope you have a good weekend!

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**From:** Carmela McHenry [mailto:cmchenry@ka-pow.com]  
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Thanks.

*Carmela McHenry*

(Direct) 916-498-7711  
(Fax) 916-448-4923

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**Sent:** Friday, March 23, 2012 10:46 AM  
**To:** Karen Clark; Tony Coelho; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Michael Burns; Susan Ramos  
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**From:** Carmela McHenry  
**Sent:** Friday, March 23, 2012 2:53 PM  
**To:** 'Karen Clark'  
**Subject:** RE: Meeting in Sacramento

No problem, Karen. Happy to be of help. I'll touch base with you, as the date gets closer, for the confirmed headcount of "in person" attendees. Have a great weekend!

*Carmela McHenry*

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**From:** Karen Clark [mailto:kclark@westlandswater.org]  
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*(c) █████*

(f) 559.241.6277  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Gayle Holman  
**Sent:** Friday, March 23, 2012 3:38 PM  
**To:** 'Dholman490'  
**Subject:** FW: Meeting in Sacramento

Are you flying this date? Just checking my options for travel.

**Gayle Holman**  
**Public Affairs Representative**  
**Westlands Water District**  
**3130 N. Fresno Street**  
**P.O. Box 6056**  
**Fresno, CA 93703-6056**  
**(559) 241-6233 (direct)**  
**(559) [REDACTED] (cell)**  
**(559) 241-6277 (fax)**  
**gholman@westlandswater.org**

-----Original Message-----

**From:** Karen Clark [mailto:kclark@westlandswater.org]  
**Sent:** Friday, March 23, 2012 10:46 AM  
**To:** Karen Clark; Tony Coelho; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Mike Burns; Susan Ramos  
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*(f) 559.241.6277*  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Jason Peltier

**Sent:** Saturday, March 24, 2012 9:28 AM

**To:** Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLoyd Fryer; 'Martin McIntyre'; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** KQED SF

## **The Salmon are Back! (But Why?)**



*Audio Report* on Mar 23, 2012 by [Amy Standen](#) from [QUEST Northern California](#)

Topics: [Biology](#), [Environment](#), [News](#), [Radio](#)

At Fisherman's Wharf, in San Francisco, what brings in the crowds are crabs. There's the Crab House. Crab Station. Crab Shack.

Larry "Duck" Collins is president of the San Francisco Crab Boat Owners Association. But even though he makes his living, or part of it, fishing crab, that's not because he likes doing it.

"Salmon fishing's fun," says Collins. "Crabbing's not."

Crabbing, he says, is like factory work. Pull up the traps, empty them out, drop them back down. Salmon? Now that's real fishing.

"We use single, barbless hooks, catch them one at a time," he says. "It's pretty exciting when you get a 40-pound salmon on the end of a piece of 90-pound mono and you haul it in, gaff off the head. It's a lot of fun."

This year, Collins is poised to do more salmon fishing than he's done in years.

Biologists say more than 800,000 Sacramento Chinook are off the coast right now. It's the biggest number they've seen since 2005.

As a result, the Pacific Fishery Management Council, which [sets guidelines](#) for commercial and sport fisheries, announced earlier this month that it's considering [three options](#) for a 2012 salmon season, all of which would give anglers a chance to catch more fish than they have in years. The final decision will be announced in early April.

### **A much-needed reprieve**

The last few years have been brutal for commercial fishermen. Salmon is a \$1.2 billion business in California, but decades of habitat loss have taken their toll. Salmon populations dropped so low that for two years, the entire season was called off. Last year, salmon fishermen were allowed back onto the ocean, but for a shorter than usual season.

Salmon, says Collins, are why people get into this business in the first place. When the industry collapsed, his friends started leaving, taking what he refers to as “land jobs.”

"When I started fishing there were 5,000 salmon boats" he says. "Last year, I'd say, 400 or 500 boats fished. So we're at ten percent of where we used to be as an industry here."

### **Great news, but will it last?**

Given the big 2012 projections, it would seem that nature is on the mend, right? Well, not if you ask Jacob Katz, who studies salmon biology at UC Davis.

"Sometimes if you put all your fish in one basket," he says, "they all hatch."

Katz means this almost literally. He says one big reason there are so many returning fish is that we humans have been producing tens of millions of baby fish in breeding facilities, called [hatcheries](#), eight of them in California. These aren't GMO fish or farmed fish. They're sold as wild salmon.

The hatchery system dates back a hundred years. Californians had started to realize that when you dam a river, you make it impossible for native salmon to complete their ocean migration. And that spawned the idea of a hatchery: What if you could produce baby salmon, or smolt, in a tank, then release them directly into the river below the dam, where they could safely migrate to and from the ocean?

"It was improving on the inefficiencies of nature," says Katz. "Look, we can do this in a bucket!"

But over time, researchers started noticing something else: In some parts of the state, hatchery fish had nearly replaced the native fish. A [study](#), released earlier this year, found that only ten percent of the fall-run Chinook salmon spawning in California's Mokelumne River had spawned naturally.

"The native salmon problem hasn't been solved," says Katz. "It's just been papered over."

"The fact that you can sometimes make a lot of fish in a bucket has masked the fact that we've almost completely driven our wild fish to extinction," he says.

### **Why the Boom and Bust?**

The question you should be asking now is this: If hatcheries have been around for a century, why are we seeing this sudden influx of fish?

The short answer is: No one knows. It could have to do with good ocean conditions, or the fact that there was more rain in 2011, and a decrease in water diversions.

But some biologists, including Katz, say the influx has everything to do with the hatchery system. Because they're produced from a smaller stock, hatchery fish lack genetic diversity. They can't adapt quickly.

So, when ocean conditions are good – with cooler temperatures and good upwelling, like last year — the fish thrive. But the pendulum can easily swing the other way.

Which brings us back to Larry Collins.

I ask Collins whether, if the salmon disappear again, he too could be forced to take a land job. He looks at me like I've just sprouted fins. He's been fishing for 29 years. There's no going back.

“When we leave the dock and go out there it’s a straight deal,” he says. “You fill your boat up, you get paid. There’s no boss. It’s a freedom thing that you get used to pretty quick when you start doing it.”

Salmon season is expected to start in April and wrap up around October or November.



**From:** Miller BJ

**Sent:** Saturday, March 24, 2012 9:45 AM

**To:** Jason Peltier

**CC:** Allison Dvorak Febbo; Ara Azhderian; B Walthall; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLoyd Fryer; 'Martin McIntyre'; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** Re: KQED SF

I love salmon and want to protect them, which is why I've always really enjoyed gaffing off their heads.

On Mar 24, 2012, at 9:27 AM, Jason Peltier wrote:

## **The Salmon are Back! (But Why?)**



*Audio Report* on Mar 23, 2012 by [Amy Standen](#) from [QUEST Northern California](#)  
Topics: [Biology](#), [Environment](#), [News](#), [Radio](#)

At Fisherman's Wharf, in San Francisco, what brings in the crowds are crabs. There's the Crab House. Crab Station. Crab Shack.

Larry "Duck" Collins is president of the San Francisco Crab Boat Owners Association. But even though he makes his living, or part of it, fishing crab, that's not because he likes doing it.

"Salmon fishing's fun," says Collins. "Crabbing's not."

Crabbing, he says, is like factory work. Pull up the traps, empty them out, drop them back down. Salmon? Now that's real fishing.

"We use single, barbless hooks, catch them one at a time," he says. "It's pretty exciting when you get a 40-pound salmon on the end of a piece of 90-pound mono and you haul it in, gaff off the head. It's a lot of fun."

This year, Collins is poised to do more salmon fishing than he's done in years.

Biologists say more than 800,000 Sacramento Chinook are off the coast right now. It's the biggest number they've seen since 2005.

As a result, the Pacific Fishery Management Council, which [sets guidelines](#) for commercial and sport fisheries, announced earlier this month that it's considering [three options](#) for a 2012 salmon season, all of which would give anglers a chance to catch more fish than they have in years. The final decision will be announced in early April.

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**Sent:** Sunday, March 25, 2012 3:38 PM  
**To:** 'Karen Clark'  
**Subject:** RE: Meeting in Sacramento

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**Sent:** Friday, March 23, 2012 1:46 PM  
**To:** Karen Clark; Tony Coelho; Carmela McHenry; Carolyn Jensen; David Bernhardt; Doug Subers; Ed Manning; Gayle Holman; Jason Peltier; Joe Findaro; Mike Burns; Susan Ramos  
**Cc:** Carmela McHenry  
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If you have any questions, please feel free to contact me at █████

Sincerely,

~Karen

*Karen Clark*  
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*Westlands Water District*  
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*Fresno, CA 93703*  
*(c) █████*  
*(f) 559.241.6277*  
[kclark@westlandswater.org](mailto:kclark@westlandswater.org)

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**To:** 'Tony Coelho'; 'Carmela McHenry'; 'Carolyn Jensen'; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Jason Peltier'; 'Joe Findaro'; 'Mike Burns'; 'Susan Ramos'  
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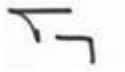
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Great Tony. I'm glad everything worked out. Hope you have a good day.

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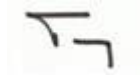
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**Subject:** Salmon fishermen attack CVPIA Restoration Fund decisions.

**Attachments:** CVPIA Restoration 3.22.2012.pdf

Good for them.



*"The New Voice of Salmon"*  
*1370 Auto Center Drive*  
*Petaluma, CA 94952*  
*(855) 251-4478*

March 22, 2012

Mr. Dan Castleberry  
Assistant Regional Manager - Fisheries  
U.S Fish and Wildlife Service  
2800 Cottage Way W2606  
Sacramento, CA 95825

Mr. Don Glaser  
Regional Director  
Mid Pacific Region  
U.S Bureau of Reclamation  
2800 Cottage Way  
Sacramento, CA 95825-1898

Dear Dan and Don:

On March 15<sup>th</sup> the Golden Gate Salmon Association (GGSA) participated in the public review of the CVPIA work plan for 2012. We have some serious concerns about that plan. This letter will provide our comments.

The GGSA is a strong supporter of the CVPIA legislation and the Restoration Plan. When Congress passed this legislation in 1992 they set some strong programs into motion to protect and enhance wildlife. Objectives were set for the rebuilding of the salmon populations along with protections for waterfowl and other species. The responsibility for executing the plan was given to the Secretary of Interior and a Restoration Fund was funded to provide the financial support for the recovery actions. The responsibility for preparing and executing the plan was subsequently passed onto the U.S. Bureau of Reclamation and the U.S. Fish and Wildlife Service.

Parts of the plan have worked well and parts of it have failed miserably. Waterfowl populations have doubled and tripled based on the program but salmon populations have

crashed to record lows with very few actions underway that will reverse these trends. The Restoration Plan has spent \$50 million a year for the past 20 years but has failed to stop the salmon declines and achieve the targeted results.

GGSA concludes that the 2012 Restoration work plans that have been prepared by USFWS and USBR are not really plans. They are simply a collection of hundreds of projects that have been proposed by field offices of the two agencies. Many of these projects are well conceived by capable and dedicated staffs and will provide some benefits to salmon at some point. What is missing is management oversight to see that the plans that are proposed and accepted are focused on the reasons the salmon runs have declined and are focused on the best investments to begin the early rebuilding process. Each project in the current plan has a goal or step to complete but there is no connection or analysis made to see if that project in fact contributes to a near term overall net gain in salmon production. Many of the projects take place in the tributaries but there is no analysis made of whether or not additional enhancements in a tributary will in fact produce additional smolts to the ocean at an early date and adults to return three years later. On the San Joaquin side, smolt losses in the South Delta are near 100%. Hundreds of thousands of additional smolts would have to be produced in the tributaries to have any true net impact on an increase in San Joaquin populations. The plan ignores this kind of analysis in its San Joaquin expenditures. The same kinds of problems exist on the Sacramento side. In some instances, up to 90% of the smolts perish on their way down the river or in the Delta. All of this suggests that there is no overall strategic analysis going into the plan to determine where the best early opportunities lie for spending Restoration funds. GGSA believes this kind of analysis would focus much more current attention in the rivers and the Delta rather than on some of the upstream projects. Upstream projects that can produce large numbers of additional smolts or endangered fish at early dates should be funded but marginal or distant future upstream projects should not be funded and more of the current funds should be funneled to the serious downstream problems. GGSA believes the bottom line of all of this is that a lot of money is being spent in the wrong places and additional salmon are not being produced. We hope to help you change this.

If one looks only at the proposed projects in the plan they all look positive and worthy of support. However, if one attempts to relate those plans to the places where salmon are currently lost and need early recovery, the link becomes very difficult or impossible.

The 2012 plan and those of recent years have no stated overall net goals in terms of additional salmon production and no supporting information of how those goals will be achieved. You cannot have a plan unless you have stated goals and specific measurable, achievable, relevant and time bound (smart) objectives that define attainment of those

goals.

Last year, GGSA analyzed the 2011 Restoration Plan and we were very disappointed. Out of \$48.4 million of Restoration Plan spending, we only found \$3.7 million in salmon projects we felt would make a short term difference in the populations. Most of the non-waterfowl money was being spent on overhead, field monitoring and studies. At that time in a letter to Mr. Don Glaser GGSA said,

**“We do not believe the Restoration Plan in its current mode of operation has a prayer of doubling or even restoring the salmon populations”**

We attribute this same statement to the 2012 Restoration Plan. We see no evidence of structural changes in the plan.

GGSA is examining the declines of the salmon runs and the reasons for those declines. We now have two top river and Delta scientists helping us. High on our list of contributing problems are: (1) Delta entrainment and the smolt mortality from Delta predation and fatalities at the pumps. (2) High mortality in the mid Sacramento River caused by flow problems and lack of protective cover for juveniles. (3) Significant drops in Upper Sacramento River spawning and rearing success caused by inadequate gravel and high temperature water released from Shasta/Keswick. (4) Large drops in American River spawning and rearing success caused by temperature and flow problems. We could name many more problems but our point here is that we see almost nothing in the Restoration Plan that will address these severe conditions.

The Restoration planning system is badly broken and needs a major overhaul if it is to accomplish the objectives set out by Congress. Most of \$50 million a year is currently unproductive in rebuilding the runs and this needs to stop. By one mechanism or another, we believe the planning process must be opened up to much broader analysis and participation to see that the projects lead to real and early solutions to the current salmon losses. We suggest that some sort of oversight or planning group should be commissioned to plan and review the projects that go into the plan. We would prefer to see this created by the local USFWS and USBR agencies but if it can't be done here, we should ask the Secretary of Interior or Congress to intervene. Following are some of the steps we feel are necessary.

- The California Department of Fish and Game and the National Marine Fisheries Service should be fully engaged in the process and provide formal comments and recommendations before a plan is adopted.
- One or more independent science panels should review the plan and provide



analysis of the magnitude of effects and likelihood that its actions will contribute to early rebuilding of the salmon runs.

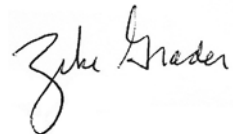
- Salmon stakeholder groups should participate in the planning process and provide comments and recommendations.
- NGOs, public agencies and other interested parties should be provided the opportunity to comment.

We appreciate the opportunity to submit our views. Please take our comments as a constructive effort. We highly value our relationship with both the Bureau and the Service. We look forward to continuing to work with you on these very difficult salmon problems.

Yours Truly.



Dick Pool  
Secretary, GGSA  
CVPIA Analyst



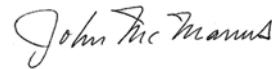
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- cc. Honorable Grace Napolitano – Minority, Sub Committee Water and Power  
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Mr. Chuck Bonham –DFG  
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Mr. Ren Lohoefer - USFWS  
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Mr. John DiStasio– California Municipal Utilities Assn.

**From:** Jason Peltier

**Sent:** Monday, March 26, 2012 12:28 PM

**To:** T Birmingham (tbirmingham@westlandswater.org); Joe Findaro; David Bernhardt

**Subject:** FW: Extending a Hand

**From:** Families Protecting The Valley [mailto:john=familiesprotectingthevalley.com@mail11.us1.rsgsv.net] **On Behalf Of**  
Families Protecting The Valley

**Sent:** Monday, March 26, 2012 9:54 AM

**To:** jason

**Subject:** Extending a Hand

VOLUME 4 ISSUE 13

MARCH 26 2012

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>> [FarmPain](#)  
>> [Drought](#)

## Extending a Hand

Some in the California water wars still insist in reaching across the aisle, extending a hand, working with the other side, etc. At Families Protecting the Valley we are in favor of anything that gets results, but working with the other side hasn't really been a constructive exercise in our humble opinion. Others in the California water wars like Congressman Devin Nunes have decided not to work with the other side, but to beat them. The people who have put years into the effort to put the Water Bond on the ballot are getting what they always get when they 'extend a hand': it gets chopped off. This is no surprise to us. Some of us worked with the other side on the San Joaquin River Restoration Settlement in 2009 against the wishes of Congressman Nunes only to find that he was right again and we got doublecrossed before the ink was dry on the deal.

By 'the other side', we mean those primarily in the environmental community who seem more interested in punishing beneficial users like farmers than helping the environment. When millions of acre-feet are being diverted supposedly for helping a particular species, and it does no good whatsoever, then the water should be

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made available to beneficial users such as communities, businesses, and farms.

In previous decades, there was a bipartisan effort with Democrats such as Governor Pat Brown and local Democratic Congressman B.F. Sisk who spearheaded responsible water projects that benefited all of society.

Now, it seems most Democrats and even East Coast Republicans simply kowtow to the most outrageous of environmental demands.

Water is a public resource and every user should be required to be responsible, even environmentalists.

Congressman Nunes has pushed H.R. 1837 through the House and says it will be sent to the Senate as many times as they can throughout the course of the year. There are a number of Democrat Senators who look to be in trouble in the upcoming election and might be persuaded to join forces on this vote. We would hope that all in the farming community would support Mr. Nunes in his effort. Yet, some of the very same people who are in support of the Water Bond did not support H.R. 1837.

Nunes' legislation does not require the building of any dams or the approval of any environmentalists. He beats them with votes. Compromising with these guys is like an exercise in futility. We've learned our lesson. We hope the rest of the farm/water community learns theirs soon.

## Senate Leader: Another Delay for Water Bond

San Francisco Chronicle

Don Thompson

State lawmakers are likely to delay voters' consideration of an \$11 billion water bond from this November until 2014, the leader of the state Senate said Thursday.

It would be the second time the measure is pushed back. The bond was originally set for voters' consideration in 2010, but former Gov. Arnold Schwarzenegger signed legislation delaying it until this year.

"In all likelihood the water bond will be put off 'til 2014, that's what I think," said Senate President Pro Tem Darrell Steinberg, D-Sacramento.

He said the priority this fall is promoting Democratic Gov. [Jerry Brown's](#) plan to raise taxes to help state programs and cut the deficit.

Money from the bond sale would go to cleaning up contaminated groundwater, increasing conservation efforts, improving sewage systems, and researching construction of at least two dams.

However, Brown and Steinberg have worried about the timing and cost of the proposal as the state faces a multibillion deficit and a continued poor economy.

Negotiators still are considering reducing the amount of the bond but leaving it on the November ballot, Steinberg said, but reached no agreement. They also are conducting public opinion research in an attempt to predict if voters would agree to the borrowing.

"It's fluid," he joked.

He previously has said it would be difficult to recreate the 2009 bipartisan compromise crafted by Schwarzenegger, a Republican, and legislators of both political parties. Any deal would need a two-thirds vote in the Legislature, requiring some Republican support, and the two parties have recently found it nearly impossible to agree on major issues.

Republican legislative leaders and spokesmen for Brown and Assembly Speaker John Perez, D-Los Angeles, were not immediately commenting.

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**From:** Jason Peltier

**Sent:** Tuesday, March 27, 2012 6:13 AM

**To:** T Birmingham (tbirmingham@westlandswater.org); Joe Findaro; David Bernhardt; Tony Coelho

**Subject:** Front page Bee

# She may be candidate Feinstein, but the California senator shuns the spotlight

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By [Michael Doyle](#)

[mdoyle@mcclatchydc.com](mailto:mdoyle@mcclatchydc.com)

By Michael Doyle

Last modified: 2012-03-27T07:31:46Z

Published: Tuesday, Mar. 27, 2012 - 12:00 am | Page 1A

Last Modified: Tuesday, Mar. 27, 2012 - 12:31 am

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WASHINGTON – Democratic Sen. [Dianne Feinstein](#) sat down at her Capitol Hill home one recent Friday afternoon for a little secret reading.

Standing over her shoulder was a [Senate intelligence committee](#) aide, a University of Virginia-trained lawyer with the necessary clearances. Together, they perused part of a massive, 4,000-page review of how the United States has interrogated and detained alleged terrorists.

"It's a very big study. It is huge," Feinstein said. "Over 4 million cables and pieces of paper have been reviewed, and every high-value detainee looked at."

But the 2 1/2-year-old study, with its 20,000 footnotes and its ultra-sensitive subject matter, will probably never become public. Instead, Feinstein and other Democratic members of the [Senate Select Committee](#) on Intelligence will likely issue some limited public findings and recommendations by fall.

Running for re-election this year, the 78-year-old Feinstein hasn't yet broken a sweat against unknown and underfunded Republican opponents. If anything, she has more freedom to pursue her work on the [intelligence committee](#), where the spotlight is usually turned off and party labels are often put aside.

Like the committee she chairs, Feinstein seems to work best when there's a problem to be solved and speeches won't suffice. In her two decades in the [Senate](#), she has passed some high-profile legislation, including an assault weapons ban and [California](#) desert protection.

She delights in making deals, gathering colleagues in a room to hash things out.

"She does want to get things done," said prominent Fresno County rancher [John Harris](#), a Republican who last year held a campaign fundraiser for Feinstein at his Coalinga ranch. "It's a tough, partisan world she works in, but she has been able to bring together divergent views to make things happen."

Starting in 2005, for instance, Feinstein quietly urged environmentalists and farmers to negotiate a San Joaquin River restoration settlement. Once lawsuit negotiations concluded in September 2006, Feinstein spent another 2 1/2 years maneuvering the accompanying legislation through [Congress](#).

The power-broker plays don't always work, and some find them vexing. A Feinstein-led effort to solve a San Joaquin Valley irrigation drainage problem, for instance, could not bridge wide differences. Later, environmentalists and [House](#) Democrats protested loudly when they thought Feinstein was trying to steer too much water to farms.

On economic and social issues, Feinstein's public voting record is essentially indistinguishable from that of her colleague, Democratic Sen. [Barbara Boxer](#), according to tallies from the nonpartisan National Journal. On foreign affairs, Feinstein votes somewhat more conservatively than Boxer.

But though the two senators' voting often overlaps, Feinstein has earned the greater reputation for pragmatism.

"If you have a business in [California](#) and you need to get something moved through [Congress](#), you go to Dianne Feinstein," said [Bill Whalen](#), a Republican research fellow at [Stanford's Hoover Institution](#). "Feinstein can go to Republicans and work with them; she is far more centrist than most Democrats in that chamber."

## Behind the scenes

Still, as the public's view of [Congress](#) plummets to all-time lows, Feinstein has not been immune. Her perennially high approval ratings slipped below 50 percent in 2008 and registered at 41 percent in September.

Public votes and prominent deals can say only so much. Like an iceberg, the work of the [intelligence committee](#) that Feinstein has chaired since January 2009 remains largely subsurface.

If she'll be traveling to Pakistan and [Afghanistan](#), she'll keep the dates veiled.

The specially sealed second-floor committee room, with its beige interior and ban on BlackBerrys and iPhones, is unmarked from the outside.

The juiciest bits of the roughly \$55 billion intelligence authorization bill her committee writes stay locked up forever.

Twice a week, on Tuesdays and Thursdays, Feinstein convenes the 15-member [Senate](#) intelligence panel. Of the committee's past 50 hearings, only six have been public.

Sometimes, the committee members will discreetly go for what Feinstein called a "roundtable" discussion at Central Intelligence Agency headquarters in [Northern Virginia](#), or at one of the 16 other federal agencies that together make up what's called the "intelligence community."

"I wouldn't call it a fun job," Feinstein said, when prompted. "Do I find it challenging? Yes."

Feinstein is the first Californian to chair a congressional [intelligence committee](#) since the [House](#) and [Senate](#) panels were established in the mid-1970s, and the state's aerospace and electronics firms certainly have a big stake in intelligence-gathering. But unlike, say, an energy and water appropriations panel also chaired by Feinstein, the [intelligence committee](#) provides few election-year bragging rights about bringing home the bacon.

"It's never even been discussed," Feinstein said, when queried about [California](#)-based intelligence contracts. "No one has really asked me for anything, that I can think of."

The job does provide a certain cachet and a presumption of expertise, which can help politically. Feinstein meets with foreign officials and makes regular television appearances in her [intelligence committee](#) role; recently, for instance, she told [CNN](#) she expects [Israel](#) "will attack [Iran](#)."

By some measures, moreover, Feinstein has helped right a foundering ship.

Between January 2005 and September 2010, [Congress](#) failed to enact the annual intelligence authorization bills that are the primary responsibility of the intelligence panels. Partisanship ruled.

One Republican committee chairman, Sen. [Richard Shelby](#) of [Alabama](#), was said by former [CIA Inspector General L. Britt Snider](#) to be more interested in "high-profile 'show trials' " than in meaningful oversight. The commission that studied the 9/11 terrorist attacks blasted the intelligence committees as "dysfunctional."

Tempers have since cooled. While Feinstein has chaired the [Senate](#) committee and Michigan Republican [Mike Rogers](#), a former FBI special agent, has chaired the [House](#) intelligence panel, [Congress](#) has completed three intelligence authorization bills. The most recent won approval in December on a 392-15 margin in the [House](#), and by voice vote in the [Senate](#).

"It is a meaningful accomplishment, and that alone means the committees are working better together," Snider, who also served as the [Senate](#) committee's general counsel, said in an interview.

## Across the aisle

In the [Senate](#), Feinstein collaborates closely with the committee's senior Republican, Sen. Saxby Chambliss of [Georgia](#), whom [Senate Democrats](#) once denounced for the slashing 2002 campaign he ran against a badly wounded Vietnam veteran.

"Sometimes Saxby has a better idea, sometimes I have a better idea, but basically we have a good, positive working relationship," Feinstein said.

Chambliss, in turn, has praised Feinstein's work, as have other Republicans who in other arenas may speak harshly of the [California Democrat](#).

"Intelligence (oversight) is working well, and this is one area where you want [Congress](#) to work well," said Rep. [Devin Nunes](#), D-Visalia, a member of the [House](#) intelligence panel.

Lawmakers, though, can still split; sometimes, vehemently.

Last year, for instance, the [Senate](#) committee approved an unusual punitive provision that enables intelligence agency officials to strip [pension benefits](#) from any former employee they "determine" leaked classified information. Skeptics worry about legitimate whistle-blowers being punished even if they've never been convicted.

But the intelligence community's anti-leak measure will not play even the tiniest role in Feinstein's reelection bid. It's far too esoteric.

Instead, the campaign will almost certainly keep a traditional course. Feinstein will focus on her clout and legislative achievements. Outgunned Republicans will play to the public's overall disenchantment with [Congress](#).

And all the while, behind closed [Senate](#) doors, some confidential work will proceed. Of this, only a few highlights may surface, as when the secret detainee report is finished this year, far later than originally expected.

"Sometimes," Feinstein allowed, "it's difficult to get the information."

Read more here: <http://www.sacbee.com/2012/03/27/4368815/she-may-be-candidate-feinstein.html#storylink=cpy>



**From:** Jason Peltier  
**Sent:** Wednesday, March 28, 2012 8:41 AM  
**To:** T Birmingham; Joe Findaro; David Bernhardt  
**Subject:** Romney in Stockton...no mention of water

## Romney visit nets \$500K

*Stockton fundraiser draws backers, foes*



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**Photo 1 of 5 | Zoom Photo +**



San Joaquin Supervisor Leroy Ornellas, center, and San Joaquin County Sheriff Steve Moore, left, wait Tuesday morning to check in outside developer Alex Spanos' compound for the \$1,000-a-plate Mitt Romney fundraiser breakfast, which drew about 500 people. CALIXTRO ROMIAS/The Record

By **Dana M. Nichols**  
Record Staff Writer  
March 28, 2012 12:00 AM

STOCKTON - Republican presidential candidate Mitt Romney told about 500 people at a fundraising breakfast Tuesday morning in Stockton that if he is elected, he will fuel economic growth by reducing regulation and taxes, according to one of the event's organizers.

"Eighty percent of his speech was on jobs and the economy," said Dean Andal, a former California Assembly member and a co-chairman of the fundraiser at the compound of billionaire developer Alex Spanos.

Andal said Romney spoke of the United States as a nation where immigrants have the chance to succeed economically. Andal said Romney believes President Barack Obama is trying to "tax and regulate" that success.

"This is a room full of small-business people and farmers," Andal said of the breakfast. "That is what they desperately wanted to hear. They want to back a presidential candidate who is going to help grow the economy."

No news media were allowed inside the event. Andal said the event, with most individuals paying \$1,000 for their breakfast ticket, met its goal of raising \$500,000 for the Romney campaign.

Andal said Romney was impressed that Stockton - his only Central Valley stop out of five fundraising events Monday and Tuesday in California - could throw such a large event.

"The other sites were La Jolla, Orange County, Beverly Hills and Palo Alto. We were in elite company," Andal said.

There may be other fundraising stops as well. While the campaigns of most presidential candidates willingly identify major fundraising events and the amount received, the Romney campaign does not.

The existence of such Romney events sometimes becomes clear later when federal campaign donation statements show a large number of checks coming in on the same day from the same geographic region.

Romney was scheduled to return to Southern California on Tuesday night for an appearance on "The Tonight Show with Jay Leno."

Andal said that during the breakfast Romney answered questions from the audience about his stance on agriculture, his tax plan, and his take on Obama's statement to Russian President Dmitry Medvedev that Obama would have more flexibility to make a missile deal after he wins re-election.

Andal said Romney was critical of Obama's statement.

Obama has defended himself, saying that the present election environment prevents the kind of "thoughtful consultations" with Congress and the Pentagon required to conclude a treaty.

Meanwhile, several dozen onlookers and demonstrators across the street from the gate to the Spanos compound failed to get even a glimpse of Romney's face.

The candidate's escort whisked him inside the compound well before the event's 8:45 a.m. starting time and took his motorcade out, this time by the compound's service entrance, just after 10 a.m.

Most of those holding signs outside the event were either supporters of presidential candidate Ron Paul or members of Occupy Stockton.

"We need sound money," said Erik Souza, 39, of Stockton, who was carrying a Ron Paul sign. "Goldman Sachs is a major contributor to Mitt Romney," Souza said, referring to one of the large banks involved in creating the kind of mortgage-backed securities that led to the 2008 financial crash.

Nearby, Julie Schardt, 64, of Stockton, held a hand-made sign that said, "Mr. Romney, you will never get the 99 percent."

"It bothers me there seems to be such a disconnect between him and the rest of us," Schardt said. "He's coming here to get his big bunch of money."

Meanwhile, inside the walls of the compound, Andal came to a different conclusion after he got to meet and speak with Romney and his wife, Ann.

"This isn't always true at this level of politics: genuinely nice people," Andal said. "I really got the feeling that they are people that have lived a real life and really understand what the rest of us go through raising kids and struggling with jobs."

**From:** Jason Peltier  
**Sent:** Wednesday, March 28, 2012 10:24 PM  
**To:** Martin McIntyre  
**Subject:** Fwd: Exec Summary NAS Report  
**Attachments:** NAS Summary.pdf; Untitled attachment 33189.htm

Begin forwarded message:

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**Subject:** FW: Exec Summary NAS Report

FYI, attached, attached is the recently released NAS report executive summary.

Sent from my iPad

Food Grows Where Water Flows

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# **Sustainable Water and Environmental Management in the California Bay -Delta**

**Committee on Sustainable Water and Environmental Management  
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This report has been reviewed in draft form by individuals chosen for their diverse perspectives and technical expertise, in accordance with procedures approved by the NRC's Report Review Committee. The purpose of this independent review is to provide candid and critical comments that will assist the institution in making its published report as sound as possible and to ensure that the report meets institutional standards for objectivity, evidence, and responsiveness to the study charge. The review comments and draft manuscript remain confidential to protect the integrity of the deliberative process. We wish to thank the following individuals for their review of this report:

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# Summary

## INTRODUCTION

California's San Francisco Bay Delta Estuary encompasses the deltas of the Sacramento and San Joaquin Rivers as well as the eastern margins of San Francisco Bay. Extensively modified over the last century and a half, it remains biologically diverse and functions as a central element in California's water supply system. Uncertainties about the future, actions taken under the federal Endangered Species Act (ESA) and companion California statutes, and lawsuits have led to conflict concerning the timing and amount of water that can be diverted from the Delta for agriculture and municipal and industrial purposes and concerning how much water—and of what quality—is needed to protect the Delta ecosystem and its component species.

The Delta is among the most modified deltaic systems in the world. Millions of acres of arid and semi-arid farm lands depend on the Delta for supplies of irrigation water, and approximately 25 million Californians depend on transport of water through the Delta for at least some of their municipal water supplies. Population growth anticipated for the first half of the 21<sup>st</sup> century is likely to create additional water demands in spite of significant reductions in per capita urban consumptive uses. In addition to supporting these consumptive uses, the Delta provides habitat for animals and plants. The Delta also supports recreational boating and fishing.

Diversions from the Delta are dominated by the exports to the irrigation and urban service areas of the federal Central Valley Project (CVP) and the State Water Project (SWP) service area, which include southern portions of the San Francisco Bay area, the western side of the San Joaquin Valley, and much of southern California. Substantial amounts of water also are diverted upstream for use in the Bay Area and Central Valley cities and farms, and within the Delta itself for local irrigation. Irrigation return flows are discharged upstream and into the Delta itself. Water supplies are highly variable from one year to another.

Despite statewide water conservation efforts, which are particularly pronounced in the urban sector, increasing seasonal restrictions on diversions have been applied, although the total amount of water diverted for export by SWP and CVP has not decreased. The CVP withdraws water from the Delta and conveys it southward into the San Joaquin Valley through a system of canals built and operated by the federal Bureau of Reclamation and various water user groups. Most of this water is used for agricultural purposes; a small amount is contracted for domestic use. The SWP withdraws water separately from the Delta and conveys it southward to agricultural users on the west side and at the very southern end of the San Joaquin Valley and subsequently over the Tehachapi Mountains into the conurbation of the South Coast Basin. Total available supplies to both CVP and SWP have been constrained in recent years by court decisions restricting diversions because of environmental concerns. In addition, many of the levees have become weak and some of the natural riparian zones of the Delta have been eroded.

Resolution of these problems is complicated by water scarcity generally and because alternative solutions impose differing degrees of scarcity for the uses advocated by different groups of stakeholders. The risk of change in water supplies, which could be manifested either by increases in the already substantial intra-seasonal and intra-annual variability or through an absolute reduction in available supplies, underscores the existence of water scarcity and illustrates ways in which such scarcity could be intensified.

In addition to serving economic purposes, Delta water has been managed for other purposes. Since the beginning of CVP operations, water diversions to users outside the Delta have been managed to reduce the effects of salinity intrusion on local water users in the western margins of the Delta. Additionally, the constitution of California requires that the waters of the state be put to "beneficial use." Although not defined, this criterion is subject to judicial review and determination. The enactment of both state and federal environmental laws has led to increased allocation of natural and stored water to environmental (instream) uses. The importance of environmental uses of water has been reflected further in many state regulatory decisions and, more recently, in judicial interpretations of the federal Endangered Species Act and the California Endangered Species Act that have led to specific water allocations. Five taxa of fish residing in or migrating through the Delta (one steelhead population, two populations of Chinook salmon, delta smelt, and green sturgeon) have been listed as threatened or endangered under the federal Endangered Species Act (ESA) and similarly listed under the California Endangered Species Act. There has not been a comprehensive agreement about how to allocate Delta water to these various purposes.

### The Current Study

Given the complex backdrop surrounding the California Delta and the importance of this water source to human and ecosystem needs, Congress and the Departments of the Interior and Commerce asked the National Research Council to review the scientific basis of actions that have been taken and that could be taken for California to achieve simultaneously both an environmentally sustainable Bay-Delta ecosystem and a reliable water supply. To balance the need to inform near-term decisions with the need for an integrated view of water and environmental management challenges over the longer-term, the National Research Council addressed this task over a term of more than two years, resulting in three reports.

First, the committee issued a report, *A Scientific Assessment of Alternatives for Reducing Water Management Effects on Threatened and Endangered Fishes in California's Bay Delta*,<sup>1</sup> focusing on scientific questions, assumptions, and conclusions underlying water-management alternatives in the U.S. Fish and Wildlife Service's (FWS) Biological Opinion on Coordinated Operations of the Central Valley Project and State Water Project (December 15, 2008) and the National Marine Fisheries Service's (NMFS) Biological Opinion on the Long-Term Central Valley Project and State Water Project Operations Criteria and Plan (June 4, 2009). The Executive Summary of this report is in Appendix A.

Second, a separate but related NRC panel issued a short report that reviews the initial public (November 2010) draft of the Bay Delta Conservation Plan (BDCP) in terms of the

<sup>1</sup> Available through The National Academies Press: <http://www.nap.edu/>

adequacy of its use of science and adaptive management—*A Review of the Use of Science and Adaptive Management in California's Draft Bay Delta Conservation Plan*.<sup>2,3</sup>

This third report addresses the following tasks (the full statement of task is in Appendix C):

- Identify the factors that may be contributing to the decline of federally listed species and, as appropriate, other significant at-risk species in the Delta. To the extent practicable, rank the factors contributing to the decline of salmon, steelhead, delta smelt, and green sturgeon in order of their likely impact on the survival and recovery of the species, for the purpose of informing future conservation actions.
- Identify future water-supply and delivery options that reflect proper consideration of climate change and compatibility with objectives of maintaining a sustainable Bay-Delta ecosystem.
- Identify gaps in available scientific information and uncertainties that constrain an ability to identify the factors described above.
- Advise, based on scientific information and experience elsewhere, what degree of restoration of the Delta system is likely to be attainable, given adequate resources. Identify metrics that can be used by resource managers to measure progress toward restoration goals.

The statement of task focuses primarily on science, and does not ask for policy, political, or legal advice. The report organization does not follow the statement of task because the committee concluded the current organization provides a more logical flow. The factors affecting the listed species are discussed in detail in Chapter 3. Future water-supply and delivery options are discussed in Chapters 2, 4, and 5. Scientific uncertainties are discussed throughout the text in Chapters 3 and 4, and the degree of restoration likely to be attainable is in Chapter 4.

## CHALLENGES AND OPPORTUNITIES

The challenges of managing water and achieving ecological rehabilitation in the Delta are numerous, including the reluctance of many participants to confront the reality that water is scarce; the distribution of water management responsibilities among many agencies and organizations; the suite of environmental factors (stressors) that affect the structure and functioning of the Delta ecosystem, including the many biological and physical changes that have occurred in the Delta; and the lack of detailed understanding of future socioeconomic, climate, biological, and other changes and the consequent lack of ability to plan for them. The following sections discuss the individual challenges; opportunities are reflected in the conclusions and recommendations.

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<sup>2</sup> Available through The National Academies Press: <http://www.nap.edu/>

<sup>3</sup> The summaries of both the recent NRC reports are provided at the end of this report as appendixes.

## Scarcity

Scarcity means that there is simply not a sufficient quantity of some resource or commodity to satisfy all wants for it. Scarcity is a pervasive phenomenon and it is persistent. Water scarcity has always been a fact in California (save, perhaps, for unusually wet periods), and therefore the committee cannot evaluate the items in its charge above without addressing scarcity. The magnitude or intensity of scarcity has grown over time and it continues to grow because demands have grown. There are numerous manifestations of scarcity. For example, legal rulings that require larger allocation of water to support fisheries and environmental flows are a manifestation of scarcity. Concerns about the Delta itself and differing positions about how Delta waters should be allocated are also manifestations of scarcity. The failure to acknowledge scarcity as a fact of life and to craft water plans and policies to address scarcity has made the management of Delta waters far more difficult than it needs to be. The issue of scarcity is discussed in detail in Chapter 2.

## Conclusions and Recommendations

### *California's Two "Co-equal Goals"*

Contemporary planning for water management in the Bay-Delta is directed at two "co-equal goals": providing a more reliable water supply for California and protecting and rehabilitating the Delta ecosystem. There are benefits of having established these goals, but the planning needed to implement these goals has not yet led to clarity on how the inevitable tradeoffs between the goals when water is short will be managed. Thus, the benefits of treating environment and water supply equally cannot be fully realized until some additional conditions are met. The implementation objectives associated with the goals need to be made specific so that when inevitable conflicts between the co-equal goals arise, guidance on how those conflicts should be resolved will be available.

### *Water-Planning Principles and Guidelines for Addressing Scarcity*

The committee recommends consideration of the following principles and guidelines for addressing scarcity in planning:

- Recognize that not all uses of water are always compatible with each other.
- Provide better definition of competing uses; and acknowledge, specify, and account for trade-offs in planning and decision making. The cost of water to users should reflect its scarcity and allocation should be based on analysis that allows for informed decision-making.
- Modify practices that do not reflect the scarcity value of water. The fact of water scarcity does not mean that the state is "running out of water." Although most surface flows have been fully allocated or over-allocated, the state can use a number of tools that optimize the use of existing supplies. As described below there are several tools currently available



for use within existing legal authority. Other tools may require additional legislative authorization.

- Enforce California's constitutional prohibition against non-beneficial, unreasonable, and wasteful water use.
- Protect values recognized under the public trust doctrine.
- Practice water conservation (including improved efficiency and productivity of use).
- Improve groundwater monitoring and regulation in all sectors.
- Consider using water markets to address scarcity. Long-term transfers of water from willing sellers to the state offer a significant opportunity for better management of California's waters consistent with the state constitutional provision. The state could then improve the availability of water for supplemental supplies and instream uses, particularly south of the Delta.

### **The Need for Integrated, Coordinated Planning**

Water management for the Bay and Delta is distributed among many agencies and organizations, a structure that hinders the development and implementation of an integrated, comprehensive management plan. Recent and current Bay-Delta planning efforts have not yet resulted in a resolution of what is best for the environment or for satisfying anticipated water needs.

### **Conclusions and Recommendations**

Those engaged in policy making and management should refresh the overall approach to management of water in California that has not been addressed significantly since the late 1960s, when a partial effort was made in the Porter-Cologne Water Quality Act of 1969, which established the State Water Resources Control Board and nine Regional Water Quality Control Boards.

The current organizational structure (or absence of structure), which lacks clear, unambiguous assignments of authorities and responsibilities, makes it difficult to develop and implement a balanced, sustainable plan. The Delta Plan and other efforts under way attempt to satisfy independent legislative enactments, but not the fundamental principles of water management reflected in the Porter-Cologne Act or the state Constitution. For instance, the current version of the Delta Plan deals at length with issues related to financing of various activities. There is no discussion of benefit/cost, efficiency, or priorities for action, all of which are essential parts of effective resource planning.

The committee is not constituted to recommend a specific organizational strategy, but does conclude that the current structure, with distributed authorities and responsibilities, has not been effective and is unlikely to be effective in the future. Issues related to planning and water management are discussed in detail in Chapters 2 and 5.

## **Environmental Stressors**

Many environmental factors, including water diversions, affect the structure and functioning of biotic communities in the Delta. Although it would be convenient if one or only a few of these factors could be identified as the source of the "problem," or even ranked with some certainty, it is not possible to do that.

Interactions among stressors and between stressors and ecosystem processes are common and can be synergistic or antagonistic. Nutrient enrichment, toxic chemicals and temperature, for example, are affected by physical forces in the system such as hydrologic and hydrodynamic factors. This complicates the interpretation and evaluation of positive, negative, neutral overall effects of any single stressor on the ecosystem and its attributes. Furthermore, species differ in their responses to most types of stress. The result is a complex biological, spatial, and temporal mosaic of impacts from this complex combination of influences.

The ecosystem and its components do not necessarily respond as a unit to most environmental factors. For example, Chinook salmon spend several years at sea and then return to pass through the Delta as adults to spawn; their eggs and young spend time in Delta tributaries before passing through the Delta on their way to the ocean to grow. Returning adult Chinook salmon always die after spawning, so they are not susceptible to chronic environmental stressors, because they die before they can be affected by them. By contrast, delta smelt spend their entire (short) lives in the Delta and so they can be chronically exposed to contaminants in the water. Being smaller and weaker swimmers than salmon, they likely are more susceptible to changes in flow than salmon. In addition, the behaviors, food, distribution in the water column, and physiologies of salmon and smelt are different, so even if they are exposed for a time to the same adverse environmental conditions, their responses to them almost certainly are different.

The above discussion compared only two species, but other species are important as well, including those that are not listed as endangered or threatened. Other species are part of the ecological community and yet they, too, differ in behavior, distribution, physiology, and susceptibility to a wide variety of environmental conditions, including contaminants. There is a complex interplay between key water quality, habitat, and sustainability issues and the drivers affecting them. Furthermore, uncertainties and scientific gaps further compound the problem.

## **Conclusions and Recommendation**

For all the above reasons, the committee concludes that only a synthetic, integrated, analytical approach to understanding the effects of suites of environmental factors on the ecosystem and its components is likely to provide important insights that can lead to enhancement of the Delta and its species. Nevertheless, the committee has evaluated several stressors in terms of their general importance. Those evaluations are summarized below and presented in detail in Chapter 3.

Given the diverse set of organisms and processes that constitute the Delta ecosystem, the ultimate success of any approach targeted to particular species seems doubtful. In contrast, broad standards established admittedly in the face of some uncertainties, do provide broad protection for the ecosystem, i.e., they adhere to the precautionary principle of doing no harm, but do so at higher water cost, potentially using water that could be used to support economic activity, sanitation, and other needs. Thus, the hard decisions will need to be made about

balancing different kinds of risk. These will be matters of policy rather than being the result of a straightforward application of "good science." Exactly because statistical correlations are not adequate to fully explain the responses of aquatic species to either flows or flow pathways, continuing the effort to better understand the processes that control the implications of both flows and flow paths is essential into the future.

Although many stressors are interacting in a complex way, some conclusions are possible with respect to individual stressors.

For migratory salmonids, and probably green sturgeon, dams are significant stressors. They impede passage, cause the loss of spawning and rearing habitat, change the abundance of predators, and affect temperature and flow.

Migrating salmon and steelhead smolts appear to incur substantial levels of mortality during Delta passage. Increasing passage of smolts through Yolo Bypass to reduce Delta passage may be a viable action for Sacramento runs.

Entrainment effects of SWP and CVP pumping are likely large in some years for some species, and thus entrainment acts as an episodic stressor that has a significant adverse effect on delta smelt population dynamics, although it is very difficult to quantify the effects in simple ways.

There is room for improvement in managing volume and timing of flows and flow paths. The committee re-emphasizes the need for life-cycle modeling and a collaborative process to reduce the paralysis that can occur from the adversarial use of models and to encourage cross-comparisons and cross-fertilization. The recent increase in life-cycle modeling for both delta smelt and salmonids is an encouraging development.

The committee has not analyzed the benefits and disadvantages of an isolated conveyance facility, because not enough specific information was available about it, and we make no recommendation with respect to its adoption as a major part of water management in the Delta. However, the committee does recommend that before a decision is made whether to construct such a facility and in what form, the sizing of the facility, its location, and the diversion design and operation, including the role of current diversions, should be analyzed as part of any integrated Delta plan, and compared to alternative water management options, including current operations.

Changes in nutrient loads and concentrations in the Delta and Bay, especially those for nitrogen and phosphorus, are stressors of increasing concern from water quality and food web perspectives. Toxic pollutants such as selenium also appear to be significant stressors, especially for sturgeon, with San Francisco Bay and the San Joaquin River being the areas of greatest concern.

The stressors also interact with each other and with changes in salinity, turbidity, and freshwater discharges resulting from hydrologic changes in the Delta and its tributaries, changes that have been attributed to water exports, changes in land use, and changes in the morphology of the Delta. The latter factor, caused by canalization and the abundance of hardened structures that also have eliminated tidal wetlands, has affected delta smelt by changing their aquatic habitats. Support for better understanding the processes that link flows, habitat structure and habitat characteristics such as salinity, turbidity and temperature should remain a high priority. Reductions in outflow caused by diversions tend to reduce the abundance of some Delta and Bay organisms.

Introduced species have caused dramatic changes in habitat, prey, and predators of the listed fish species in the Delta. Introductions of nonnative species will continue into the future as

management controls that substantially reduce risk are difficult and expensive to implement. Changes in human activities and climate change could exacerbate the frequency of invasions and persistence of invading organisms in the future. Early detection through monitoring is useful in order to prepare for likely changes to the ecosystem.

Largely because negative effects of hatcheries are difficult to observe, the committee cannot reach a conclusion as to whether and how much hatcheries have contributed to the decline in wild populations of salmonids in the Central Valley. The committee judges that adoption of recent conservation guidelines under a unified hatchery management plan will reduce (but not eliminate) risk to wild populations from hatcheries, and probably represents the most viable option for maintaining populations of salmonids in the Central Valley unless or until other methods are found to increase the productivity of wild populations.

Coastal ocean productivity is one of the most significant factors determining the ocean survival of juvenile salmon and the number of adult salmon that return to spawn. When ocean conditions are unfavorable for salmon and steelhead, those effects can be partially ameliorated by increasing the diversity of wild and hatchery salmon ocean entrance timing.

Currently, disease does not appear to be a significant stressor factor for juvenile or adult salmon or other fish species in the Delta.

Consideration of the large number of stressors and their effects and interactions leads to the conclusion that efforts to eliminate any one stressor are unlikely to reverse declines in the listed species. Opportunities exist to mitigate or reverse the effects of many of the above stressors. To make it more likely that any actions to rehabilitate the ecosystem are cost-effective, continued effects analyses, modeling, and monitoring will be needed.

### **Environmental Change and Ecosystem Rehabilitation**

Climate change is one of the most challenging and important issues confronting the management and rehabilitation of the Delta ecosystem. Changes in climate are expected to have profound effects on the physical and ecological structure of the Delta as well as the nature of water issues in the California. The cascading effects of climate change begin with increasing air temperature, which over the 50-year planning horizon of the Delta's BDCP, is predicted to increase between 1° and 3°C. As a result, snowmelt will occur earlier than currently, and more winter precipitation will fall as rain, as opposed to snow, than currently. The changes are expected to have large effects on temporal and spatial hydrologic patterns even if the average annual precipitation volume did not change.

In addition to changes in hydrologic patterns, sea level also is expected to rise as a result of climate warming. Sea-level rise would interact in complex ways with altered hydrologic patterns and the effects are not easy to predict. However, it does seem clear that the combination of sea-level rise and altered hydrologic patterns would increase the risk to Delta infrastructure, such as levees.

Increased temperature likely would reduce the distribution of salmonids in the Central Valley. In many parts of their range they encounter summer temperatures near the lethal limit for them. The frequency and duration of such temperatures is expected to increase, and their effects likely would be exacerbated by changes in hydrologic patterns.

If the climate projections are correct, more frequent extreme events will increase the need for Central Valley water for both environmental and human uses. In this case, managers may be

asked to consider hard choices. While such the predicted changes may not come to pass, the committee encourages continued critical and comprehensive studies of the full range of future possibilities and how to adapt to climate change. The implications of climate change for the Delta and for environmental rehabilitation and water supplies are discussed in detail in Chapter 4.

## Conclusions and Recommendations

Habitat loss and alterations, climate change, and unpredictable levee failure pose significant challenges in the formulation of plans for sustaining the Bay and Delta ecosystem. However, there are many opportunities to steer the future evolution of the ecosystem by addressing future challenges.

Extensive physical changes in the Delta ecosystem and the tributary watersheds, and continuously evolving changes, such as land subsidence in the Delta islands, will not allow the re-creation of habitat as it once existed in the pre-disturbance state. Delta restoration programs will need to balance consideration of an ecosystem approach with the ESA's emphasis on individual species. Programs will need to focus on the interaction of biological, structural, and physical aspects of habitats and how they may change in the future. Even without ESA-listed species, there still would be a need to guide the ecosystem toward desirable states.

Assessments suggest that many species will be affected by changes in the pattern and types of precipitation. Changes already are being observed. Projected increases in the mean sea level and the extremes have the potential to increase the frequency of levee failures and inundation of islands, in part because the land inside the levees continues to subside through oxidation of peat. Sea level rise also has the potential to enhance saltwater intrusion and alter water quality.

Planning and evaluation of future environmental and economic scenarios will need to address the uncertainties in projections, integrated analysis, and the development of risk management strategies (e.g., adaptive management). The uncertainties are higher about the environmental aspects of operations than about the reliability aspects of water deliveries. Climate change implications and the continued increase in water demands in the Bay-Delta system and beyond will exacerbate the competition for water and limit the ability to meet the co-equal goals.

Future planning should include the development of a climate-change-based risk model and analysis that incorporates data on the actual changes in Delta conditions as well as alternative future climate scenarios and their probability. The real challenge is deciding how to adapt to a new environment. Strategies to deal with the expected and unprecedented changes will need to consider many factors, including targeted demand management, increased surface and groundwater storage consistent with minimizing environmental impacts, enhanced flexibility in the water management system through operational optimization and maximum flexibility for moving water, and developing an understanding of and establishing environmental flows for the ecosystem.

The instability and interdependence of levees—failure of one levee can affect others—are likely to be major issues for achieving any measure of water-supply reliability or ecosystem rehabilitation. Continuing the status quo of improving levees will not always be the most environmentally sustainable or economically defensible response in the years ahead. Changes in

the levee system, and even removal or modification of some levees, could be good for at least parts of the ecosystem.

Resource managers dealing with the Delta will need to determine the degree of "restoration" achievable through intervention and adaptation. The Delta as it existed before large-scale alteration by humans cannot be recreated. With respect to species, habitats, productivity and other aspects, the future Delta will still be a functioning ecosystem but different from the one that exists today. However, there is a considerable capacity to guide the direction of the Delta towards a more desirable future by focusing on a functioning resilient ecosystem without abandoning individual efforts to protect individual native species. Achieving the above will require extensive, thoughtful, and transparent planning. That planning will need to include finding ways to reconcile diverse interests without pretending that everybody can have what they want.

### **The Role of Science and Planning: A Path Forward**

Science is necessary to inform actions and proposals related to restorations of all kinds. However, science alone does not provide the entire prioritized, integrated analysis that the committee recommends. For instance, science can provide information on options regarding the control of ammonium to maintain an adequate food supply for fish, on the consequences of different schedules for investment in Delta levees to protect agriculture, and on the degree of effectiveness of future diversion restrictions to protect salmon in the mainstream of the Sacramento River. However, science cannot decide which choice is the best policy. That requires societal and political considerations as well and information on potential benefits and costs. Using the best science is only part of what is needed to resolve the competing interests. The role of science, including its limitations, is discussed in detail in Chapter 5.

### **Conclusions and Recommendations**

The committee concludes that the lack of explicitly integrated comprehensive environmental and water planning and management results in decision-making that is inadequate to meet the Delta's and state's diverse needs, including environmental and ecological conditions in the Delta. In addition, the lack of integrated, comprehensive planning has hindered the conduct of science and its usefulness in decision making. Lack of transparency exacerbates these matters and erodes public trust.

The committee recommends California undertake a comprehensive review of its water planning and management functioning, and design modifications to existing responsibilities and organizations that will anticipate future needs including those identified in this report. These needs include dealing with scarcity, balanced consideration of all statewide water use practices and water-engineering alternatives; and adaptive management that can adjust to changing conditions. The result should be that regions such as the Delta can be effective partners in a coordinated statewide effort.

The committee makes no recommendation of any specific organizational strategy for institutional changes. Any strategy should incorporate the public's desires and achieve the public's trust while allowing for decisions to be made.

Delta conditions identified in previous chapters indicate that scarcity of water for all needs will become severe. While more effective planning is being developed, the state will need to use its water resources efficiently and productively. A variety of tools are available, including demand-side management (conservation, including more-efficient and more-productive water use) and supply-side management (water transfers conducted by the state or within a new central planning function, new sources of supply, more-integrated management of ground- and surfacewater, enforcement of the constitutional reasonable and beneficial use limitations and invocation of the state Public Trust Doctrine to reconsider past allocation decisions). Thus reliability-dependent users (urban, industrial and agricultural) would have some long-term confidence that supplies will be more predictable. As part of its oversight of such transfers, the state needs to insure that necessary instream flow levels are maintained. Continued, substantial investments in monitoring, modeling, and other research to inform policy choices will be essential.





**From:** Jason Peltier  
**Sent:** Tuesday, April 3, 2012 3:38 PM  
**To:** Craig Manson; David Bernhardt; Julie MacDonald  
**Subject:** Nature: BOR integrity

## Nature | News

# US integrity effort hits troubled water

Allegations by integrity officer who lost his job are a setback for plan to quash political inference in science.

- [Eugenie Samuel Reich](#)

03 April 2012



Salmon deaths in the Klamath River have prompted legislation to remove dams and restore water flow.

When US President Barack Obama announced a government-wide effort to protect federal science from political interference, the US Department of the Interior (DOI) took an early lead. In 2011, it became the first agency to finalize a new policy on scientific integrity and it has hired ten scientific-integrity officers to work with staff in its various bureaus. But the DOI may also be the first to run into a problem with the way the policies are implemented, as one of those officers claims to have been fired for upholding the guidelines.

“I thought I was doing the job I was hired to do and was doing the right thing. I was stifled,” says Paul Houser, a hydrologist at George Mason University in Fairfax, Virginia, who was appointed as scientific-integrity officer

for the DOI's Bureau of Reclamation in April 2011. Houser was fired on 10 February and filed a complaint under the DOI's scientific-integrity policy two weeks later.

Houser alleges that he lost his job because he raised concerns with the DOI about the way it had represented the science behind a plan to remove four hydroelectric dams from a stretch of the Klamath River that straddles the California–Oregon border. DOI spokeswoman Kate Kelly declined to say why Houser had been fired. But watchdog groups say that Houser's complaint underscores the need for protections for those tasked with enforcing the new policies.

## Related stories

- [Bear researcher frozen out](#)
- [Integrity policy unveiled at last](#)
- [Paul Houser's complaint \(PDF\)](#)

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“There are things the president has to lead on and whistle-blower protection is one of them,” says Francesca Grifo, director of the Union of Concerned Scientists’ scientific-integrity programme in Washington DC.

Houser says that his concerns conflicted with the DOI's desire to build a strong public case for removing the dams. Environmental groups support the removal because the dams reduce water flow in the river and have been blamed for large numbers of salmon deaths. Secretary of the Interior Kenneth Salazar was planning to decide whether the dams should be removed by 31 March, but legislation authorizing removal has stalled in the US Congress.

Houser says that he was asked by a press officer to check some material that the DOI planned to make public about the probable environmental impact of the dams’ removal. But the material painted an overly rosy picture of the benefit, Houser says. For example, in a summary document, the DOI said that studies had shown that the annual production of Chinook salmon (*Oncorhynchus tshawytscha*) would rise by 83% a year after the dams were removed. However, it did not include any of the uncertainties about how the population would respond that an expert panel commissioned by the DOI had listed. In the final version of the summary — which is now on a government website — the number was changed to 81.4%. “That number expresses an accuracy that’s ludicrous,” says Houser. The figure comes from an unpublished computer-modelling study and had an uncertainty range of –59.9% to 881.4%, which was not reported in the summary.

Houser says that last September, his supervisor, deputy commissioner for external and intergovernmental affairs Kira Finkler, chided him for documenting his concerns. He says Finkler told him that “the secretary wants to remove those dams”. Finkler did not respond to questions from *Nature* about the situation, but the scientific-integrity officer who is overseeing implementation of the department’s policy, Ralph Morgenweck, confirms that Houser’s complaint is being investigated.

Kelly says that the DOI is looking forward to the outcome of the investigation. “We believe all actions will be proven to be fully justified,” she says, adding that the studies the agency is using about the impact of the dam removal are available on the Internet for anyone to see and review. However, members of the expert panel contacted by *Nature* have said that they, too, felt that the materials flagged by Houser played down the uncertainties in scientific predictions.

The 30 March deadline for US science-related agencies to finalize their integrity policies has now passed, but cases such as Houser’s could set the tone for how well the effort takes root, says Grifo. “These early examples are incredibly important.”

Both Grifo and Jeff Ruch, executive director of the watchdog group Public Employees for Environmental Responsibility in Washington DC, believe that an absence of whistle-blower protections is likely to make the policies less effective. And for Houser, the departmental hierarchy may not have helped: the scientific-integrity officers report to the heads of the bureaus they work with, which seems to leave the officers vulnerable and could weaken their ability to uphold policies. Morgenweck says that the DOI may reconsider the reporting line when it next revises its policy.

**From:** Bernhardt, David L.

**Sent:** Wednesday, April 11, 2012 6:11 AM

**To:** Jason Peltier; Thomas W. (Tom) Birmingham Esq.

**Subject:** Fwd: Feinstein to hear from both sides of Valley ag, Fresno Bee, April 11, 2012

**Date:** April 11, 2012 9:00:45 AM EDT

**To:** "Bernhardt, David L." <[DBernhardt@BHFS.com](mailto:DBernhardt@BHFS.com)>, "Smith, Ryan A." <[RSmith@BHFS.com](mailto:RSmith@BHFS.com)>

**Subject:** Feinstein to hear from both sides of Valley ag, Fresno Bee, April 11, 2012

[Feinstein to hear from both sides of Valley ag, Fresno Bee, April 11, 2012](#)

In the Valley, there's east-side agriculture and west-side agriculture. Today, Dianne Feinstein is hitting them both.

California's senior senator will attend a noon fundraiser at the Sanger home of Nisei Farmers League President Manuel Cunha Jr., and she will follow that up with a dinner event at the north Fresno home of Westlands Water District board President Don Peracchi.

Both Cunha and west-side grower Mark Borba -- who is among the hosts at the Peracchi event - downplayed the east-west differences, but it is clear that both events will have distinctly different aims.

For Borba and the west-siders, water is paramount. West-side agriculture is currently forecast to receive just 30% of its allocation of Central Valley Project water, down from 45% promised in last year's initial forecast.

West-siders want that increased, especially as they look at the number of storms that have hit the far north of the state, where much of the federal water originates that flows through the Sacramento-San Joaquin Delta and on to the west side.

Feinstein, they hope, can help. "I know she's trying," Borba says.

At the same time, Cunha is focused on immigration reform. He decided on holding the fundraiser at his home for several reasons. One at the top: He wants Feinstein to see the citrus groves around her. Citrus is a crop that requires "hand labor," he said.

Cunha and others are busy putting the finishing touches on a new immigration reform proposal they hope next week to take to Feinstein.

"It's water on that [west] side," Cunha said. "But if we [east-siders] don't have workers, we can't get anything done."

And, in a climate where so much attention is heaped on the west-side and its water woes, the east-siders also want to show Feinstein that they have issues, too, Cunha said.

What both events do have in common is a plethora of Republicans driving both events, even though Feinstein is a Democrat.

One has to wonder about all that money Rep. Devin Nunes -- a Tulare Republican -- spent last fall on a television ad campaign that lambasted the federal Environmental Protection Agency and "liberal Bay Area politicians" while taking particular aim at Feinstein.

These events will bring to three the number of major fundraisers prominent Valley Republicans have hosted and attended this year for Feinstein.

She not only has been helpful to the cause, Borba said -- which is why Republicans pay to attend her fundraisers -- but she also holds the power.

"California has two U.S. senators, and both have Ds behind their names," said Borba, referring to Democrats Feinstein and Barbara Boxer.

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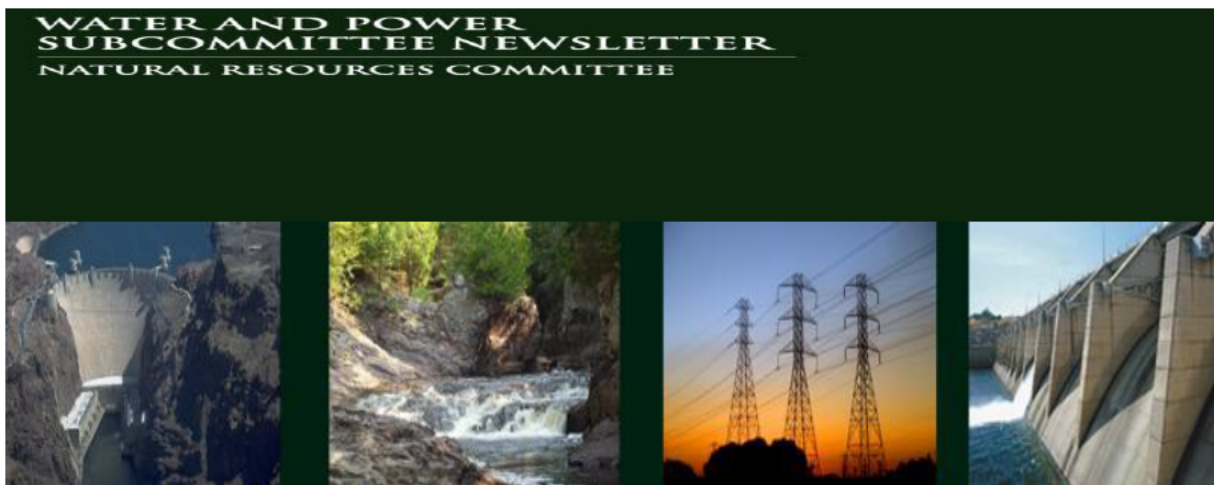
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**From:** Bernhardt, David L.  
**Sent:** Monday, April 16, 2012 11:56 AM  
**To:** Jason Peltier (jpeltier@westlandswater.org)  
**Subject:** FW: Subcommittee on Water and Power Newsletter

FYI

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**From:** Hrobsky, Jon A.  
**Sent:** Monday, April 16, 2012 11:18 AM  
**To:** Bernhardt, David L.; Smith, Ryan A.  
**Subject:** Subcommittee on Water and Power Newsletter



## House Passes Water and Power Legislation to End Man Made California Drought

In February, the House of Representatives passed H.R. 1837, the Sacramento-San Joaquin Valley Water Reliability Act, with a bipartisan vote of 246-175. This comprehensive bill would restore water deliveries that have been cut-off due to federal regulations and environmental lawsuits, protect tens of thousands of jobs, ensure a reliable water supply for people and fish, secure water rights, and save taxpayer money by ending unnecessary and dubious government projects. Read more about the legislation [here](#).

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Bureau of  
Reclamation Small  
Conduit Hydropower  
Development and  
Rural Jobs Act of  
2011, sponsored by



## Hastings Invites Secretary Chu to Testify on PMA Memo that Could Increase Energy Rates for Millions of American Families

Rep. Scott Tipton  
(CO-03).

Earlier this month, House Natural Resources Committee Chairman Doc Hastings (WA-04) sent a letter to Department of Energy (DOE) Secretary Steven Chu inviting him to testify at a [Full Committee oversight hearing](#) on Thursday, April 26th regarding concerns raised by Secretary Chu's recent [Memorandum](#) to the Power Marketing Administrations (PMAs). The hearing will be an opportunity for Members of the Natural Resources Committee, which has jurisdiction over the PMAs, to question Secretary Chu on the potential energy cost increases that could result from his Memorandum. The letter also asks for DOE to delay implementation of the Memorandum until proper Congressional oversight and public input occur. Read more [here](#).

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## Chairmen Question Obama Administration on Program to Mail out CASH

In March, Chairman Doc Hastings and Water & Power Subcommittee Chairman Tom McClintock (CA-04) sent letters to the Bureau of Reclamation and the Office of Management and Budget requesting information on the use of American tax dollars to pay for a controversial Department of the Interior (DOI) survey on the need to remove four privately owned dams on the Klamath River in Oregon and California.

In 2011, DOI distributed a nationwide survey with the questionable purpose of measuring the societal, non-economic value of removing the four dams. The survey consisted of several waves of mailings, some of which included a two dollar bill used as an incentive to respond and a letter stating that DOI will send an additional \$20 if the completed survey is returned before a specific deadline. According to the Federal Register, an estimated 10,400 households were contacted about the survey. In questioning before the House Water and Power Subcommittee, the Bureau of Reclamation was unable to provide an accounting of how much had been spent on this survey. Read more about the letters and the program [here](#).

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## House Approves Bipartisan Plan to Create Jobs, Expand Renewable Energy Hydropower Production

### Members



**Tom McClintock, CA 04**

### Chairman

Louie Gohmert, TX 01

Jeff Denham, CA 19

Scott Tipton, CO 03

Paul Gosar, AZ 01

Raul Labrador, ID 01

In March, the House of Representatives passed H.R. 2842, the Bureau of Reclamation Small Conduit Hydropower Development and Rural Jobs Act of 2012, with a bipartisan vote of 265-154. Sponsored by Rep. Scott Tipton (CO-03), H.R. 2842 is an action plan to create new American jobs and eliminate bureaucratic hurdles to small hydropower production.

Kristi Noem, SD At Large

Doc Hastings, WA 04 (Ex Officio)

Specifically, the bill authorizes hydropower development on existing, man-made Bureau of Reclamation water canals and pipes, cuts government red-tape by streamlining a duplicative regulatory process and reduces administrative costs for developing these green energy projects. Such man-made facilities are already on disturbed ground, have no environmental impact and have already gone through environmental review. Read more about the legislation [here](#).

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## **Subcommittee Holds Hearing on Water Storage Importance to Rural Communities, Job Creation, Economic Growth**

In February, The House Natural Resources Subcommittee on Water and Power held an oversight hearing on "Water for Our Future and Job Creation: Examining Regulatory and Bureaucratic Barriers to New Surface Storage Infrastructure." The hearing highlighted the regulatory burdens that hinder vital water storage improvement projects that help create jobs, increase agriculture production, generate hydropower and grow the economy and common sense ways to overcome those hurdles. Cumbersome environmental regulations have delayed critical water storage projects for years while urban growth, environmental litigation and age strain current water storage infrastructure. Read more [here](#).

## **In Case You Missed It**

- [Protecting Endangered Farmers](#) The Wall Street Journal, Editorial
- [House Passes Bill to Boost Hydropower Development on Federal Canals, Pipelines](#) Congressional Quarterly, by Lauren Garner
- [House approves bill easing hydropower development rules](#) The HILL, by Pete Kasperowicz



## Critical Resources

- [National and Local Organizations Support Republican Plan to Stop Man-Made California Drought](#)
- 



### **Committee on Natural Resources**

**United States House of Representatives**  
1324 Longworth House Office Building  
Washington, D.C. 20515

**From:** Jason Peltier

**Sent:** Wednesday, April 18, 2012 9:12 AM

**To:** T Birmingham; Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLoyd Fryer; 'Martin McIntyre'; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** Just To Ruin Your Day

If we took all the garbage like this as THE WORD, certainly we would go insane. None the less, this looks like the Master Hit list that we see woven thru the words and thoughts of our “perfect world” critics:

## Tina Swanson's Blog

# California's Bay Delta Conservation Plan Has No Clothes

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Print this page



Posted April 17, 2012

Remember the story of [the emperor's new clothes](#)? Two tailors promise the emperor a magnificent suit of clothes made of fabric that is invisible to those who are unworthy of their positions. The emperor, who can't see the fabric himself but doesn't want to admit it, parades before his subjects. The crowd plays along with the pretence, unwilling to speak out, until a child blurts out the truth—the emperor is wearing nothing at all!

The parallels between this fable and the current collision of science and policy in California's iconic San Francisco Bay-Delta are disturbing. At issue, development of the [Bay Delta Conservation Plan](#), intended to rescue the estuary's collapsing ecosystem, prevent extinction of half a dozen fish species (including salmon) and improve the reliability of water supplies pumped from Delta channels to farms and cities. The result of this five-year, \$140 million effort is a [draft plan](#) that, according to its own “effects analysis,” would make the existing situation worse by further degrading estuarine habitat, harming most of the fish species it is supposed to help and increasing water diversions from this already over-tapped system.

How could BDCP reach this point, when the Bay-Delta is one of the best studied estuaries in the world? Even in this contentious system, there is no disagreement that many factors have contributed to the ecosystem's decline. Here are the major problems, the BDCP's preliminary proposed actions to address them and a summary of what the best current science says about the likely effectiveness of those actions.

**Freshwater inflow and water management:** Like all estuaries, the Bay-Delta is dependent on the inflow of fresh water. For many Bay-Delta fish and invertebrate species, higher inflows result in higher abundance levels: this is the strongest scientific relationship we have between

any environmental variable and biological response in this ecosystem. But water diversions, which reduce flows, have been increasing for the past several decades. In the 2000s, diversions from the Delta reached record high levels, effectively [leaving the estuary in chronic drought conditions](#). The resultant [degraded habitat](#) and [mortality of fish at the Delta pumps](#) contributed to dramatic fish declines, leading to court-ordered reductions in pumping and prompting [California's State Water Resources Control Board](#) to conclude that current levels of freshwater inflow are insufficient to protect public trust resources in the Bay-Delta. But one of BDCP's preliminary proposed "conservation measures" is to build a new "isolated conveyance" facility (previously known as the peripheral canal) with a new diversion in the northern Delta, and to increase the amount of water exported from the Delta by an average of 20 percent. This increased pumping would further reduce freshwater flows to the estuary, which, according to decades of science, will worsen estuarine ecosystem conditions and reduce species abundance. A new conveyance facility is neither inherently beneficial nor inherently harmful to the ecosystem—its impacts or benefits depend on how it would be operated. But, the current proposal to increase diversions would clearly harm the estuary and Bay-Delta fish species.

**Habitat:** Most of the Delta's tidal marshes and floodplains were [lost a century ago when levees were constructed and wetlands drained to create farmland](#). Loss of these productive habitats undoubtedly had significant negative impacts on the ecosystem back then but it is unlikely that this is a major cause of recent ecosystem or species declines. Restoration may be desirable for a number of reasons (and, particularly [floodplain restoration](#) may provide ecological benefits), but there is little scientific evidence that tidal marsh restoration will contribute to recovery for most of the endangered fish species. [This study of Bay-Delta tidal marshes](#) reported that there was a "high degree of uncertainty" that restoration would benefit Bay-Delta fishes and [this study](#) warned that restored tidal marshes were likely to be invaded by harmful invasive plants and fishes, which would minimize (or eliminate) benefits for native species targeted for recovery. Despite this, the BDCP relies heavily on restoration of tidal wetland habitat and, to justify these actions, [cites and misrepresents](#) some of these same studies to claim that these conservation measures "may contribute significantly" to the food web and benefit species.

**Water Quality:** Delta waters are listed under the Clean Water Act as ["impaired" for a number of pollutants](#) and [studies](#) indicate that toxic contaminants and toxic algae blooms may be a contributing factor for species' declines. BDCP's conservation measures to address this problem are to provide funding for a few already-required pollution mitigation programs and to conduct limited monitoring in some areas. Meanwhile, other BDCP actions that reduce flows would likely [exacerbate blooms of toxic algae](#), which occur under low flow conditions.

**Food supply:** Some twenty years ago, the abundance of the planktonic plants and animals that are important components of the Bay-Delta's food web declined dramatically, the victim of the [invasive overbite clam](#) and [ammonium pollution](#) from agricultural drainage and sewage treatment plants, according to scientific research. Food limitation has been identified as a [contributor to the recent fish declines](#). BDCP proposes to address this problem by restoring tidal marsh and floodplain habitats, claiming (with little scientific support) that these restored habitats will produce plankton and increase the estuarine food supply. But, even assuming that part of the plan does work, BDCP's plans to further reduce flows would likely improve habitat conditions for the clam and reduce dilution of ammonium pollution, exacerbating the

principal causes of low planktonic food supplies in the Bay-Delta. And, since most of BDCP's proposed restoration projects would not be implemented for at least 20 years, the plan offers little to address this immediate problem.

**Invasive species:** In the Bay-Delta, invasive species are both a cause and a symptom of the degraded ecosystem. The most harmful species—the overbite clam, Brazilian waterweed and predatory warm-water fishes—thrive in stable, low flow conditions like those that now regularly occur because of excessive water diversions. Invasive species are notoriously difficult to get rid of, particularly when environmental conditions are favorable for them: there is little evidence that chemical or physical removal control programs either reduce their abundance or improve ecosystem conditions. Nevertheless, BDCP's approach to this problem is to fund a few localized programs to try to suppress Brazilian water weed and predatory fish populations (but not the clam). Meanwhile, BDCP's plans for reduced flows and (possibly risky) tidal marsh restoration projects could worsen the Bay-Delta's invasive species problem.

From my perspective as a scientist who has conducted research and worked on policy development in the Bay-Delta for the past 20 years, the mismatch between what the science tells us about this ecosystem and what the BDCP currently proposes for its conservation plan is ... astonishing.

But from a more jaded perspective, I suppose it's understandable how it came to this—and an illustrative example of the dangers of disproportionately empowering some special interests in the development of a public resource management plan. The [Delta export water contractors](#), (the tailors in our fable) who have played a dominant role in the development of the BDCP, have developed a set of seemingly impressive, but likely ineffective, conservation measures (the emperor's invisible suit). Unlike the fable, however, the crowd has not been silent: reviews by scientists from government agencies, [stakeholder groups](#), the [Delta Science Program](#) and the [National Academy of Sciences](#) have been uniformly critical.

The BDCP is an important and ambitious effort to manage a complex ecosystem to balance environmental and human needs, but it's hard to imagine that it can succeed without fundamental changes to its [use of science to develop an effective plan](#). To protect the Bay-Delta and sustainably manage California's water resources—and to avoid further embarrassment—it's time for the BDCP to put some scientific clothes on.

*NRDC Science Center intern Catherine Corrigan-Ashe contributed to this post.*

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## Comments ([Add yours](#))

**Deirdre Des Jardins — Apr 18 2012 01:32 AM**

A thorough and excellent analysis.

Wanted to add that the proposed extensive BDCP habitat restoration program is a part of the 138,000 to 191,000 acre habitat restoration that was promised as part of the 2000 CALFED Record of Decision, and that the export water contractors refused to fund when it ran through most of its bond money.

CALFED's "30 year, comprehensive management plan for the Delta" only lasted about five years -- until all of the proposed conveyance projects were built. When it came time to actually re-evaluate the plan, and if it was meeting the ecosystem and water quality goals, the legislature and the export contractors decided it was "too expensive."

Given that the export contractors have made no commitments to funding habitat BDCP habitat restoration, it seems likely that those plans will see the same fate, particularly in light of the upwards of \$30 billion price tag.

**From:** Jason Peltier

**Sent:** Wednesday, April 18, 2012 4:45 PM

**To:** T Birmingham; Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLoyd Fryer; 'Martin McIntyre'; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** Cowin

**Attachments:** photo.JPG

Mark did great in Rules this pm.

**From:** Jason Peltier

**Sent:** Thursday, April 26, 2012 9:28 AM

**To:** Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLoyd Fryer; 'Martin McIntyre'; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** new DOI Adaptive Mgmt. guidance, link in release [136 pages]

## Interior Department Publishes New Guide on Use of Adaptive Management in Natural Resource Decision-Making

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### Provides Managers Examples of Successful Adaptive Strategies

**04/20/2012**

Contact: Drew Malcomb (DOI) (202) 208-6301

Catherine Puckett (USGS) (352) 278-0165

**WASHINGTON** – When managers at Denali National Park needed to protect nesting golden eagles from potential disturbance by hikers, they used an adaptive management approach that allowed them to monitor and adjust their strategies based on what they learned over the course of time about how well they were working.

Natural resource managers are increasingly using adaptive management as a tool in making complex decisions whether to protect eagles, set waterfowl harvest limits or manage the flow of rivers to meet recreational, agricultural and other needs.

As a result, the Interior Department recently published *Adaptive Management: The U.S. Department of the Interior Applications Guide*, a new guide that provides federal, state, tribal and other natural resource managers with tools to more effectively address the complexities and uncertainties involved in natural resource management, especially under challenging conditions such as climate change.

"This guide represents an important part of Interior's commitment to help natural resources managers deal with climate change and other natural resource challenges," Deputy Secretary of the Interior David J. Hayes said. "In today's complex world, such a guide is an essential tool for resource managers, who must make sound decisions in the face of scientific uncertainty."

Adaptive management provides a mechanism for managers, scientists and other stakeholders to collaboratively improve resource management over time by learning from previous and ongoing management activities and outcomes, Hayes said.

For example, adaptive management will be a valuable tool in helping inform Interior's Landscape Conservation Cooperatives and Climate Science Centers, as well as in other departmental efforts to address pressures on natural resources caused by threats ranging from urban sprawl, to wildfire risk, to climate change-related impacts through collaborative and science-based approaches.

The *Applications Guide* includes case studies ranging from river flow management and protecting migratory birds to siting renewable energy projects. These are drawn from four areas important to Interior and its partners: climate change, water resources, energy, and human impacts on the landscape. The examples show the breadth of adaptive management applications at different scales and different levels of complexity.

Rhea Suh, Assistant Secretary for Policy, Management, and Budget, led the Department's efforts to develop the applications guide. "The applications guide is intended to be useful to multiple audiences, from technical users who need information on particular scientific issues, to managers who want practical information on the sequence of steps in project applications," said Suh, who charged Interior's Office of Policy Analysis with coordination of the new guide.

The guide has significant contributions from Interior bureau and office staff, representing a wide range of management interests and expertise. Its lead authors were Ken Williams and Ellie Brown from the U.S. Geological Survey, with assistance from many other contributors.

The Applications Guide is available for download at <http://www.doi.gov/ppa/upload/DOI-Adaptive-Management-Applications-Guide.pdf>. It was designed to complement and build on the framework established by its companion document, *Adaptive Management: The U.S. Department of the Interior Technical Guide*, available at <http://www.doi.gov/ppa/upload/TechGuide.pdf>.

While the *Technical Guide* includes a discussion of the basic criteria for applying adaptive management, as well as step-by-step descriptions of implementation, the *Applications Guide* includes examples, case studies and discussion of "how-to" issues.

### **Current Adaptive Management Projects Detailed in the New Guide Include:**

**Dam Operations at Tallapoosa River in Alabama:** Adaptive management has been used at the R.L. Harris Dam on the Tallapoosa River in east-central Alabama since 2005 as part of an innovative approach to the Federal Energy Regulatory Commission relicensing process. The U.S. Fish and Wildlife Service has collaborated with U.S. Geological Survey scientists, the dam's private utility operator and other stakeholders to manage water to improve habitat for native aquatic species at risk, including four fish species and one mussel species. The project provides a useful template for incorporating adaptive management and decision support into future FERC relicensing processes.

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**From:** Jason Peltier  
**Sent:** Thursday, April 26, 2012 9:42 AM  
**To:** Julie MacDonald  
**Subject:** Fwd: new DOI Adaptive Mgmt. guidance, link in release [136 pages]

Begin forwarded message:

**From:** "Jason Peltier" <[jpeltier@westlandswater.org](mailto:jpeltier@westlandswater.org)>  
**Date:** April 26, 2012 9:28:06 AM PDT  
**To:** "Allison Dvorak Febbo" <[AFebbo@swc.org](mailto:AFebbo@swc.org)>, "Ara Azhderian" <[Ara.Azhderian@sldmwa.org](mailto:Ara.Azhderian@sldmwa.org)>, "B Walthall" <[bwalthall@kcwa.com](mailto:bwalthall@kcwa.com)>, "BJ Miller" <[REDACTED]@[REDACTED]>, "Brenda Burman" <[bburman@mwdh2o.com](mailto:bburman@mwdh2o.com)>, "Byron Buck" <[BBuck@sfcwa.org](mailto:BBuck@sfcwa.org)>, "Carolyn Jensen" <[cjensen@ka-pow.com](mailto:cjensen@ka-pow.com)>, "Chris Beale" <[CBeale@resourceslawgroup.com](mailto:CBeale@resourceslawgroup.com)>, "Clare Foley" <[cfoley@farmwater.org](mailto:cfoley@farmwater.org)>, "Cliff Schulz" <[cschulz@kmtg.com](mailto:cschulz@kmtg.com)>, "Curtis Creel" <[ccreel@kcwa.com](mailto:ccreel@kcwa.com)>, "D Nelson" <[Dan.Nelson@sldmwa.org](mailto:Dan.Nelson@sldmwa.org)>, "Dan Keppen" <[dankeppen@charter.net](mailto:dankeppen@charter.net)>, "David Bernhardt" <[DBernhardt@BHFS.com](mailto:DBernhardt@BHFS.com)>, "Ed Manning" <[emanning@ka-pow.com](mailto:emanning@ka-pow.com)>, <[frances.mizuno@sldmwa.org](mailto:frances.mizuno@sldmwa.org)>, "Gayle Holman" <[gholman@westlandswater.org](mailto:gholman@westlandswater.org)>, "Greg Zlotnick" <[REDACTED]@[REDACTED]>, "Jason Peltier" <[jpeltier@westlandswater.org](mailto:jpeltier@westlandswater.org)>, "Joe Findaro" <[joe.findaro@akerman.com](mailto:joe.findaro@akerman.com)>, "Jon Rubin" <[jon.rubin@sldmwa.org](mailto:jon.rubin@sldmwa.org)>, "Kear,Adam C" <[akear@mwdh2o.com](mailto:akear@mwdh2o.com)>, "Laura King Moon" <[Laurak@swc.org](mailto:Laurak@swc.org)>, "Laura Simonek" <[lsimonek@mwdh2o.com](mailto:lsimonek@mwdh2o.com)>, "Lloyd Fryer" <[REDACTED]@[REDACTED]>, "[REDACTED]" <[REDACTED]@[REDACTED]>, "Martin McIntyre" <[REDACTED]@[REDACTED]>, "Mike Henry" <[mhenry@farmwater.org](mailto:mhenry@farmwater.org)>, "Mike Wade" <[mwade@farmwater.org](mailto:mwade@farmwater.org)>, "Neudeck,Randall D" <[rneudeck@mwdh2o.com](mailto:rneudeck@mwdh2o.com)>, "Philp,Thomas S" <[TPhilp@mwdh2o.com](mailto:TPhilp@mwdh2o.com)>, "Rodriguez, Larry" <[lrodriguez@kcwa.com](mailto:lrodriguez@kcwa.com)>, "Roger Patterson" <[rpatterson@mwdh2o.com](mailto:rpatterson@mwdh2o.com)>, "Rose Schlueter" <[rschlueter@westlandswater.org](mailto:rschlueter@westlandswater.org)>, "Sheila Greene" <[sgreene@westlandswater.org](mailto:sgreene@westlandswater.org)>, "Steve Arakawa" <[sarakawa@mwdh2o.com](mailto:sarakawa@mwdh2o.com)>, "Sue Ramos" <[sramos@westlandswater.org](mailto:sramos@westlandswater.org)>, "Terry Erlewine" <[terlewine@swc.org](mailto:terlewine@swc.org)>, "Tom Boardman" <[tboardman@apex.net](mailto:tboardman@apex.net)>, "Tom Glover" <[tglover@westlandswater.org](mailto:tglover@westlandswater.org)>, "Tom Mongan" <[REDACTED]@[REDACTED]>, "[REDACTED]" <[REDACTED]@[REDACTED]>, "Valerie Connor" <[vconnor@sfcwa.org](mailto:vconnor@sfcwa.org)>  
**Subject:** new DOI Adaptive Mgmt. guidance, link in release [136 pages]

## Interior Department Publishes New Guide on Use of Adaptive Management in Natural Resource Decision-Making

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**Provides Managers Examples of Successful Adaptive Strategies**

**04/20/2012**

Contact: Drew Malcomb (DOI) (202) 208-6301  
Catherine Puckett (USGS) (352) 278-0165

**WASHINGTON** — When managers at Denali National Park needed to protect nesting golden eagles from potential disturbance by hikers, they used an adaptive management approach that allowed them to monitor and adjust their strategies based on what they learned over the course of time about how well they were working.

Natural resource managers are increasingly using adaptive management as a tool in making complex decisions whether to protect eagles, set waterfowl harvest limits or manage the flow of rivers to meet recreational, agricultural and other needs.

As a result, the Interior Department recently published *Adaptive Management: The U.S. Department of the Interior Applications Guide*, a new guide that provides federal, state, tribal and other natural resource managers with tools to more effectively address the complexities and uncertainties involved in natural resource management, especially under challenging conditions such as climate change.

“This guide represents an important part of Interior’s commitment to help natural resources managers deal with climate change and other natural resource challenges,” Deputy Secretary of the Interior David J. Hayes said. “In today’s complex world, such a guide is an essential tool for resource managers, who must make sound decisions in the face of scientific uncertainty.”

Adaptive management provides a mechanism for managers, scientists and other stakeholders to collaboratively improve resource management over time by learning from previous and ongoing management activities and outcomes, Hayes said.

For example, adaptive management will be a valuable tool in helping inform Interior’s Landscape Conservation Cooperatives and Climate Science Centers, as well as in other departmental efforts to address pressures on natural resources caused by threats ranging from urban sprawl, to wildfire risk, to climate change-related impacts through collaborative and science-based approaches.

The *Applications Guide* includes case studies ranging from river flow management and protecting migratory birds to siting renewable energy projects. These are drawn from four areas important to Interior and its partners: climate change, water resources, energy, and human impacts on the landscape. The examples show the breadth of adaptive management applications at different scales and different levels of complexity.

Rhea Suh, Assistant Secretary for Policy, Management, and Budget, led the Department’s efforts to develop the applications guide. “The applications guide is intended to be useful to multiple audiences, from technical users who need information on particular scientific issues, to managers who want practical information on the sequence of steps in project applications,” said Suh, who charged Interior’s Office of Policy Analysis with coordination of the new guide.

The guide has significant contributions from Interior bureau and office staff, representing a wide range of management interests and expertise. Its lead authors were Ken Williams and Ellie Brown from the U.S. Geological Survey, with assistance from many other contributors.

The Applications Guide is available for download at <http://www.doi.gov/ppa/upload/DOI-Adaptive-Management-Applications-Guide.pdf>. It was designed to complement and build on the framework established by its companion document, *Adaptive Management: The U.S. Department of the Interior Technical Guide*, available at <http://www.doi.gov/ppa/upload/TechGuide.pdf>.

While the *Technical Guide* includes a discussion of the basic criteria for applying adaptive management, as well as step-by-step descriptions of implementation, the *Applications Guide* includes examples, case studies and discussion of “how-to” issues.

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**From:** Tom Birmingham  
**Sent:** Thursday, May 3, 2012 10:25 AM  
**To:** 'Paul M. Bartkiewicz'  
**Subject:** RE: ESA litigation

Paul,

David Bernhardt is a former Solicitor of the Department of the Interior and is among the best litigation minds with whom I have dealt. His contact information is:

David L. Bernhardt  
Brownstein Hyatt Farber Schreck, LLP  
1350 I Street, NW, Suite 510  
Washington, DC 20005-3305

202.872.5286

Tom

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**From:** Paul M. Bartkiewicz [mailto:PMB@bkslawfirm.com]  
**Sent:** Thursday, May 03, 2012 10:20 AM  
**To:** tbirmingham@westlandswater.org  
**Subject:** ESA litigation

Hi Tom,

When I saw you at the KMTG tribute to Fred Girard, you mentioned an ESA attorney whom you would recommend that YCWA consider concerning litigation on the NMFS BO on Daguerre Point Dam and Englebright Dam. Could you please provide me his contact information? Thank you. Best regards, PMB

Paul M. Bartkiewicz  
BARTKIEWICZ, KRONICK & SHANAHAN  
1011 22nd Street  
Sacramento, CA 95816  
Tel: (916) 446-4254  
Cell: (916) 531-8474  
Fax: (916) 446-4018  
[pmb@bkslawfirm.com](mailto:pmb@bkslawfirm.com)

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**From:** Jason Peltier

**Sent:** Friday, May 4, 2012 8:03 AM

**To:** T Birmingham; Ed Manning; Joe Findaro; Carolyn Jensen (cjensen@ka-pow. com); David Bernhardt; Sheila Greene; Craig Manson; Tony Coelho; Doug Subers

**Subject:** fishermen

From Central Valley Business Times

**Fishing fleet sues feds — says Delta water exports hurt salmon**

SAN FRANCISCO

May 3, 2012 11:17am

<http://www.centralvalleybusinesstimes.com/templates/comments.cfm?ID=20973> <<http://www.centralvalleybusinesstimes.com/templates/print.cfm?ID=20973>> <<http://www.centralvalleybusinesstimes.com/templates/emailstory.cfm?path=/stories/001/&ID=20973>>

- **Suit contends interim contracts violate Congressional intentions**
- 'For decades Reclamation has gone around Congress and the law'

California commercial fishermen are suing the federal government over a decades old practice of rolling over "interim water" contracts — mostly with Central Valley farmers — that the fishermen say violates the law.

The Pacific Coast Federation of Fishermen's Associations (PCFFA) and the Crab Boat Owners Association (CBOA) filed suit in U.S. District Court in San Francisco challenging the U.S. Bureau of Reclamation's practice of promising what the suit contends are excessive amounts of water to contractors regardless of the water year or impacts on valuable fish stocks or the environment.

Reclamation is breaking the law, the fishing organizations say, by taking far too much water from the Sacramento-San Joaquin River Delta - San Francisco Bay Estuary and by failing to consider impacts on wild fish nurseries in the estuary and upstream river valleys.

The water contract renewals should be stopped until proper environmental review is completed, the commercial fishermen say.

"For decades Reclamation has gone around Congress and the law," says Zeke Grader, executive director of the Pacific Coast Federation of Fishermen's Associations. "Reclamation has blessed the destruction of the Bay Delta estuary, while sanctioning excessive water exports under 'interim water service contracts.'"

The legal action contends that in 1992 Congress directed the Bureau of Reclamation not to issue long term water contracts without pricing reforms and full environmental review of the impacts of importing the irrigation water along with the impacts to the communities, and river habitat where the water is taken.



Instead, they say, Reclamation has adopted contract language that it “will renew” the interim contracts, conducting environmental review which overlooks the impacts of taking this water from river regions and then delivering it to the west side of the San Joaquin Valley.

“Continually extending existing water exports treats these badlands irrigators like sacred cows,” says Larry Collins, president of the San Francisco Crab Boat Owners Association. “Exorbitant amounts of water are being exported to benefit large corporate irrigators at the expense of the entire west coast fishing industry. Cotton and almond growers get their cheap water. Meanwhile fishing, especially salmon, suffers. Jobs are lost. And the quality of life along the Delta and rivers degrades.”

The fishing fleet suit challenges Reclamation’s practice of issuing ‘Findings of No Significant Impacts’ on supposed ‘temporary’ or interim water renewal contracts that have been extended for more than 20 years. This practice effectively allows extreme water export levels while ignoring the impacts of those diversions on the Delta Estuary and source water. The suit contends.

“Based on outdated water needs assessments and assuming that the current excessive water exports at present quantities and prices will have ‘no effect on the environment,’ Reclamation’s environmental assessment process is nothing more than a charade,” says Stephan Volker, the attorney representing the groups.

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**From:** Jason Peltier [mailto:jpeltier@westlandswater.org]

**Sent:** Friday, May 04, 2012 7:48 AM

**To:** T Birmingham; Ed Manning; Joe Findaro; Carolyn Jensen (cjensen@ka-pow.com); David Bernhardt (dbernhardt@bhfs.com); Sheila Greene; Craig Manson; Tony Coelho; Doug Subers

**Subject:** BDCP

Here is the BDCP work plan for next week.

You will find the link to the fishery agency “Red Flag” documents below:

### **Fish Agency Red Flag Comments and Responses on Effects Analysis**

This document is a compilation of the fish agency “red flag” comments and ICF’s responses thereto regarding the BDCP draft Effects Analysis. These informal comments were developed by agency staff to flag quickly issues that need to be resolved prior to final submittal of the plan. As such, they do not reflect an official agency position or decision. ICF’s responses are preliminary and intended to facilitate further discussion and resolution of issues. ICF and the agencies will be working to address the red flag issues in the coming weeks. [Review the document.](#)

**From:** Jason Peltier

**Sent:** Friday, May 4, 2012 9:16 AM

**To:** 'Karen Clark'; 'Tony Coelho'; 'Carmela McHenry'; 'Carolyn Jensen'; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Joe Findaro'; 'Mike Burns'; 'Susan Ramos'

**Subject:** Scty Laird letter to Hayes

**Attachments:** Deputy Secretary Hayes letter 5 3 12.pdf

I understand this will be posted on the web this am.



May 3, 2012

David Hayes  
Deputy Secretary of the Interior  
1849 C Street, NW  
Washington, DC 20240

Dear Deputy Secretary Hayes,

Since the beginning of the Brown administration, we have made significant headway in formulating a proposed project for the Bay Delta Conservation Plan (BDCP) that will meet the dual goals of water supply reliability and Delta ecosystem restoration. Thanks to our continued efforts together, we are on track to present a real and workable plan as part of the goals we have set for this year. That said there will be some workable delays in the release of the environmental documents.

From the outset, we have all agreed that science should drive the design of the project and our plans for its implementation. The fish and wildlife agencies are currently reviewing and responding to a substantially improved scientific analysis of habitat restoration, water flows, and other ecological measures to achieve regulatory standards of the federal Endangered Species Act and Natural Community Conservation Planning Act. As a result, we anticipate that we will soon be able to announce some significant adjustments in the overall program that will reflect our commitment to using the best science.

This should not interfere in any way with our preparations for a public announcement of the key elements of a framework for the proposed project with the Governor and Secretary Salazar in mid-to-late July. Unfortunately, it does mean we will not be ready to release public review drafts of BDCP and its environmental impact report/statement at the end of June.

I want to be sure you are aware of the progress we are making. We appreciate the continued cooperation of our federal partners and your efforts to ensure that the project continues to move forward, on time and on track.

Sincerely,

A handwritten signature in blue ink that reads 'John Laird'.

John Laird  
Secretary for Natural Resources

1416 Ninth Street, Suite 1311, Sacramento, CA 95814 Ph. 916.653.5656 Fax 916.653.8102 <http://resources.ca.gov>



**From:** Jason Peltier

**Sent:** Monday, May 7, 2012 12:59 PM

**To:** Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLoyd Fryer; 'Martin McIntyre'; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** FW: Information about tonight's Delta show on KALW 91.7

Fun for me!

---

**From:** Susan Britton [mailto:██████████@██████████.██████████]

**Sent:** Monday, May 07, 2012 10:03 AM

**To:** Susan Britton

**Subject:** Information about tonight's Delta show on KALW 91.7

Please forward to all interested and please call in tonight at (415) 841-4134!

FOR IMMEDIATE RELEASE

City Visions Radio presents:

“A Peripheral Canal for the Delta?”

Airs live on Monday May 7, 7:00 pm, KALW 91.7 FM San Francisco

Contact: Susan Britton, [susie@cityvisionsradio.com](mailto:susie@cityvisionsradio.com), (415) 990-1825

(San Francisco) May 7, 2012. It's been called the third rail of California politics -- fraught with even more peril than Prop 13 -- and the most controversial proposal in the contentious history of California water. We're talking, of course, about the Bay Delta Conservation Plan and its proposed centerpiece: a massive conveyance system to move millions of acre feet of water annually south out of the Sacramento River and around the ecologically fragile San Joaquin-Sacramento River Delta. Proponents say that the project is essential for addressing risks of levee failure, reducing conflicts over fish, and ensuring reliable water deliveries to 25 million consumers in the Bay Area, the Central Valley and Southern California. Opponents, on the other hand, say that the project is unaffordable, premised on unfair and unsustainable water allocations, and certain to do irreparable harm to fisheries, the Delta ecosystem and the communities that depend on them.

Governor Brown has voiced support for the Delta conveyance and is expected to formalize his position in July, when he will publicly announce the key elements of the project. In the meantime, join us as we parse the pros and cons of the Delta debate. Do we need a peripheral canal, and at what cost? What would the environmental impacts of a water diversion of this scale be? What would the project mean for Bay Area ratepayers and taxpayers? And how can you get involved?

Joining host Joseph Pace are:

- Barbara Barrigan-Parrilla, Campaign Director for Restore the Delta, a nonprofit organization committed to promoting the health of the Sacramento-San Joaquin River Delta and the well-being of Delta communities.
- Gary Bobker, Executive Director of the Bay Institute, a nonprofit organization committed to protecting and restoring the San Francisco Bay and its watershed.
- Joan Maher, Deputy Operating Officer for the Santa Clara Valley Water District, which manages water resources for the 1.8 million residents of Santa Clara County.
- Jason Peltier, Chief Deputy General Manager of Westlands Water District, a 600,000-acre agricultural district on the west side of the San Joaquin Valley serving approximately 600 farms.

"A Peripheral Canal for the Delta?" will air live Monday, May 7, 2012 at 7:00 p.m. on City Visions Radio, KALW 91.7 FM. To learn more about City Visions Radio, visit [www.cityvisionsradio.com](http://www.cityvisionsradio.com), and to listen live online, subscribe to our podcast or search our archives, visit [www.kalw.org](http://www.kalw.org).

During the show, call us with your questions and comments at (415) 841-4134. Or email us at [feedback@cityvisionsradio.com](mailto:feedback@cityvisionsradio.com), post a comment at [www.kalw.org](http://www.kalw.org) or visit us on [Facebook](#) anytime.

-- Susan Britton  
Producer  
City Visions Radio  
KALW 91.7 FM San Francisco  
[www.kalw.org](http://www.kalw.org)  
[www.cityvisionsradio.com](http://www.cityvisionsradio.com)  
[susie@cityvisionsradio.com](mailto:susie@cityvisionsradio.com)  
415.990.1825

**From:** Jason Peltier  
**Sent:** Monday, May 7, 2012 1:00 PM  
**To:** Martin McIntyre  
**Subject:** FW: Information about tonight's Delta show on KALW 91.7

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**Sent:** Monday, May 07, 2012 12:59 PM  
**To:** Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLOYD Fryer; 'Martin McIntyre'; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'  
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During the show, call us with your questions and comments at (415) 841-4134. Or email us at [feedback@cityvisionsradio.com](mailto:feedback@cityvisionsradio.com), post a comment at [www.kalw.org](http://www.kalw.org) or visit us on [Facebook](#) anytime.

-- Susan Britton  
Producer  
City Visions Radio  
KALW 91.7 FM San Francisco  
[www.kalw.org](http://www.kalw.org)  
[www.cityvisionsradio.com](http://www.cityvisionsradio.com)  
[susie@cityvisionsradio.com](mailto:susie@cityvisionsradio.com)  
415.990.1825

**From:** Bernhardt, David L.  
**Sent:** Monday, May 7, 2012 1:10 PM  
**To:** Jason Peltier  
**Subject:** Re: Information about tonight's Delta show on KALW 91.7

Good luck.

David Bernhardt  
202-872-5286  
202-████-████ (cell)

On May 7, 2012, at 3:59 PM, "Jason Peltier" <[jpeltier@westlandswater.org](mailto:jpeltier@westlandswater.org)> wrote:

Fun for me!

---

**From:** Susan Britton [mailto:████.████@████.████]  
**Sent:** Monday, May 07, 2012 10:03 AM  
**To:** Susan Britton  
**Subject:** Information about tonight's Delta show on KALW 91.7

Please forward to all interested and please call in tonight at (415) 841-4134!

FOR IMMEDIATE RELEASE

City Visions Radio presents:

“A Peripheral Canal for the Delta?”

Airs live on Monday May 7, 7:00 pm, KALW 91.7 FM San Francisco

Contact: Susan Britton, [susie@cityvisionsradio.com](mailto:susie@cityvisionsradio.com), (415) 990-1825

(San Francisco) May 7, 2012. It's been called the third rail of California politics -- fraught with even more peril than Prop 13 -- and the most controversial proposal in the contentious history of California water. We're talking, of course, about the Bay Delta Conservation Plan and its proposed centerpiece: a massive conveyance system to move millions of acre feet of water annually south out of the Sacramento River and around the ecologically fragile San Joaquin-Sacramento River Delta. Proponents say that the project is essential for addressing risks of levee failure, reducing conflicts over fish, and ensuring reliable water deliveries to 25 million consumers in the Bay Area, the Central Valley and Southern California. Opponents, on the other hand, say that the project is unaffordable, premised on unfair and unsustainable water allocations, and certain to do irreparable harm to fisheries, the Delta ecosystem and the communities that depend on them.

Governor Brown has voiced support for the Delta conveyance and is expected to formalize his position in July, when he will publicly announce the key elements of the project. In the meantime, join us as we parse the pros and cons of the Delta debate. Do we need a



peripheral canal, and at what cost? What would the environmental impacts of a water diversion of this scale be? What would the project mean for Bay Area ratepayers and taxpayers? And how can you get involved?

Joining host Joseph Pace are:

- Barbara Barrigan-Parrilla, Campaign Director for Restore the Delta, a nonprofit organization committed to promoting the health of the Sacramento-San Joaquin River Delta and the well-being of Delta communities.
- Gary Bobker, Executive Director of the Bay Institute, a nonprofit organization committed to protecting and restoring the San Francisco Bay and its watershed.
- Joan Maher, Deputy Operating Officer for the Santa Clara Valley Water District, which manages water resources for the 1.8 million residents of Santa Clara County.
- Jason Peltier, Chief Deputy General Manager of Westlands Water District, a 600,000-acre agricultural district on the west side of the San Joaquin Valley serving approximately 600 farms.

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[susie@cityvisionsradio.com](mailto:susie@cityvisionsradio.com)  
415.990.1825

**From:** Jason Peltier  
**Sent:** Monday, May 7, 2012 1:11 PM  
**To:** 'Bernhardt, David L.'  
**Subject:** RE: Information about tonight's Delta show on KALW 91.7

Thanks, I am in a really bad mood about now, hope it doesn't come across too strong.

---

**From:** Bernhardt, David L. [mailto:DBernhardt@BHFS.com]  
**Sent:** Monday, May 07, 2012 1:10 PM  
**To:** Jason Peltier  
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[susie@cityvisionsradio.com](mailto:susie@cityvisionsradio.com)

415.990.1825

**From:** Craig Manson

**Sent:** Thursday, May 10, 2012 5:06 PM

**To:** 'Brenda Davis'; 'Diane Rathmann'; 'Jon Rubin'; 'Sheehan, Rebecca D'; 'Andrea Matarazzo'; 'Bill Kershaw'; 'Cynthia Larsen'; 'Dan O'Hanlon'; 'David Bernhardt'; Fitzgerald, Martha L.; 'Gary Sawyers'; 'Gus Bauman'; 'Katherine T. Gates'; 'Lauren Schmidt'; 'Lily Chinn'; 'Lyle Cook'; 'Macgregor Scott'; 'Martin Ruano'; Mathews, Mark J.; 'Norman C. Hile'; 'Roger Martella'; 'Sam Boxerman'; 'Steve Sims'

**Subject:** New Legal Intern at Westlands

I'm pleased to announce that Philip Williams (UOP McGeorge '13) will be spending the summer in the General Counsel's Office at Westlands Water District. Philip is a bright and friendly fellow who comes from a "nontraditional" background for water law. A veteran of two tours in Iraq, and a member of the highly elite U.S. Army Airborne Rangers, Philip also was Assistant Professor of Military Science at BYU. He is a graduate of UC Davis and earned an MBA from the University of Utah. During his eight years in the Army, he was twice decorated with the Bronze Star, and achieved the rank of Captain. His interest in water law and policy stems directly from conditions he observed in Iraq.

You may have contact with him as he performs various assignments for us.

Philip Williams joins us on Tuesday May 15, 2012.

Craig Manson  
General Counsel  
Westlands Water District  
400 Capitol Mall, 27<sup>th</sup> Floor  
Sacramento, CA 95814  
916-321-4225  
916-844-4979  
916-256-2419

**From:** Brenda Davis

**Sent:** Thursday, May 10, 2012 5:10 PM

**To:** Craig Manson; Brenda Davis; Diane Rathmann; Jon Rubin; Sheehan,Rebecca D; Andrea Matarazzo; Bill Kershaw; Cynthia Larsen; Dan O'Hanlon; David L. Bernhardt; Fitzgerald, Martha L.; Gary Sawyers; Gus Bauman; Katherine T. Gates; Lauren Schmidt; Lily Chinn; Lyle Cook; Macgregor Scott; Martin Ruano; Mathews, Mark J.; Norman C. Hile; Roger Martella; Sam Boxerman; Steve Sims

**Subject:** Re: New Legal Intern at Westlands

Sounds like a great addition.

---

**From:** "Craig Manson" <cmanson@westlandswater.org>

**Sender:** "Craig Manson" <cmanson@westlandswater.org>

**Date:** Thu, 10 May 2012 17:06:22 -0700

**To:** 'Brenda Davis'<bwdavis@bwdlawgroup.com>; 'Diane Rathmann'<drathmann@aol.com>; 'Jon Rubin'<Jon.Rubin@sldmwa.org>; 'Sheehan,Rebecca D'<RSheehan@mw2h2o.com>; 'Andrea Matarazzo'<Andrea@pioneerlawgroup.com>; 'Bill Kershaw'<wkershaw@kcrlegal.com>; 'Cynthia Larsen'<clarsen@orrick.com>; 'Dan O'Hanlon'<dohanlon@kmtg.com>; 'David Bernhardt'<dbernhardt@bhfs.com>; 'Fitzgerald, Martha L.'<MFitzgerald@BHFS.com>; 'Gary Sawyers'<gsawyers@sawyerslaw.com>; 'Gus Bauman'<gbauman@bdlaw.com>; 'Katherine T. Gates'<kgates@bdlaw.com>; 'Lauren Schmidt'<lschmidt@bhfs.com>; 'Lily Chinn'<lchinn@bdlaw.com>; 'Lyle Cook'<lcook@kcrlegal.com>; 'Macgregor Scott'<msscott@orrick.com>; 'Martin Ruano'<mruano@orrick.com>; 'Mathews, Mark J.'<MMathews@BHFS.com>; 'Norman C. Hile'<nhile@orrick.com>; 'Roger Martella'<RMartella@sidley.com>; 'Sam Boxerman'<sboxerman@sidley.com>; 'Steve Sims'<SSims@bhfs.com>

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400 Capitol Mall, 27<sup>th</sup> Floor  
Sacramento, CA 95814  
916-321-4225  
916-844-4979  
916-256-2419

**From:** Bernhardt, David L.  
**Sent:** Thursday, May 10, 2012 6:36 PM  
**To:** Craig Manson  
**Subject:** Re: New Legal Intern at Westlands

That's great Craig.

David Bernhardt  
202-872-5286  
202-████-████ (cell)

On May 10, 2012, at 8:07 PM, "Craig Manson" <[cmanson@westlandswater.org](mailto:cmanson@westlandswater.org)> wrote:

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400 Capitol Mall, 27<sup>th</sup> Floor  
Sacramento, CA 95814  
916-321-4225  
916-844-4979  
916-256-2419

**From:** Jason Peltier

**Sent:** Friday, May 11, 2012 9:06 AM

**To:** Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLoyd Fryer; 'Martin McIntyre'; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** FW: San Joaquin County , Bd of Supervisors Water Report

**Attachments:** DO\_89323.pdf

Thanks.

---

**From:** Jon Rubin [mailto:Jon.Rubin@sldmwa.org]

**Sent:** Friday, May 11, 2012 7:29 AM

**To:** Ara Azhderian; jpeltier@westlandswater.org

**Subject:** San Joaquin County , Bd of Supervisors Water Report

See attached – nothing of great surprise.





**AGENDA ITEM SUBMITTAL FORM  
BOARD OF SUPERVISORS  
CLERK OF THE BOARD**

44 North San Joaquin Street, Suite 627  
Stockton, California 95202

For Clerk's Use Only:  
AGENDA NUMBER

**SUBMIT ONE COPY OF THIS FORM WITH EACH BOARD AGENDA ITEM.**

At the time of submitting your agenda item documents, please **provide ONE ORIGINAL & 7 COPIES OF THE BOARD LETTER AND ANY ACCOMPANYING DOCUMENTS** (Resolutions, Board Orders, Contracts, etc.) for distribution after Board Approval.

**If more than one original is required, you must provide the appropriate number of originals to be executed by the Board of Supervisors.**

**DATE:** APRIL 24, 2012

**DEPARTMENT:**

**PUBLIC WORKS**

**CONTACT & PHONE #:** FRITZ BUCHMAN 8-3089

**AGENDA ITEM TITLE:** ORAL PRESENTATION AND STAFF REPORT UPDATE ON SACRAMENTO-SAN JOAQUIN DELTA ACTIVITIES

**PROPOSED AGENDA PLACEMENT DATE:** MAY 8, 2012 **PROPOSED CALENDAR:** DISCUSSION

**DISTRIBUTION:** (MAILING ADDRESSES MUST BE PROVIDED IF NOT A COUNTY DEPARTMENT)

**TO:**

**DOCUMENT**

**# OF COPIES**

Board Clerk

Oral Report

County Counsel

Public Works  
(Central Files:)  
(Water Resources:)  
(Fiscal:)

**Special instructions to the Clerk of the Board:**

**AGENDA ITEMS MUST BE REVIEWED AND SIGNED OFF BY THE DEPARTMENT HEAD, COUNTY ADMINISTRATOR AND COUNTY COUNSEL.**

Department Head Signature

Date

4/24/12

WR-12D038-R1

<b>County Administrator</b> 4/24/2012 10:22:58 AM	<b>County Counsel</b> 4/24/2012 11:19:00 AM	<b>COB</b>
 <b>BOBBY MAGEE</b>	 <b>LAWRENCE SISTERS</b>	4/24/2012 11:25:53 AM



THOMAS M. GAU  
DIRECTOR



P. O. BOX 1810 - 1810 E. HAZELTON AVENUE  
STOCKTON, CALIFORNIA 95201  
(209) 468-3000 FAX (209) 468-2999  
[www.sjgov.org/pubworks](http://www.sjgov.org/pubworks)

FRITZ BUCHMAN  
DEPUTY DIRECTOR

MICHAEL SELLING  
DEPUTY DIRECTOR

STEVEN WINKLER  
DEPUTY DIRECTOR

ROGER JANES  
BUSINESS ADMINISTRATOR

April 24, 2012

Board of Supervisors  
44 North San Joaquin Street, Suite 627  
Stockton, California 95202

ORAL PRESENTATION AND STAFF REPORT  
UPDATE ON SACRAMENTO-SAN JOAQUIN DELTA ACTIVITIES

Dear Board Members:

IT IS RECOMMENDED:

That the Board of Supervisor receive an oral presentation and accept the attached Staff Report Update on Sacramento-San Joaquin Delta Activities.

REASONS FOR RECOMMENDATION:

Approximately two-thirds of the Sacramento-San Joaquin Delta (Delta) is located within San Joaquin County (County), comprising of approximately one-third of the County's area. In total, Delta agricultural production is valued at approximately \$795 million annually resulting in over \$1 billion in additional economic benefit. The Delta is also a critical thoroughfare for infrastructure such as transportation highways, natural gas storage and transmission, and water supply conveyance; a maze of navigable waterways supporting maritime commerce and the transportation of goods, boating and recreation, and fish and wildlife; and a source for local drinking water, as the City of Stockton is preparing to bring the Delta Water Supply Project online this year.

The County is incontrovertibly tied to the long-term economic, social, and environmental viability of the Delta. Current proposals, including State and Federal policies in addition to a proposed isolated conveyance facility, could have a significant adverse affect on communities in the Delta and the Delta watershed. A few examples that conflict with the long-term economic, social, and environmental viability of the Delta and, therefore, the County as a whole include:

- Limiting the sovereignty of local agencies to make land use decisions;
- The diminution of water rights to the detriment of senior water right holders and the area of origin;
- The conversion of over 100,000 acres of agriculture in the Delta shallow water habitat in-lieu of direct mitigation for export pumping and endangered species takings; and,

Board of Supervisors  
ORAL AND STAFF REPORT  
DELTA ACTIVITIES

-2-

- Potential for continued deterioration in Delta water quality and quantity, resulting in impacts to agriculture, wildlife, recreation and commerce in the Delta.

Consistent with Board of Supervisors' policy direction, County staff has worked to represent the County's position, defend County interests, and constructively participate in many of the ongoing State and Federal activities surrounding the Delta. Since the passage of the Comprehensive Water Package, including the Delta Reform Act of 2009, the need for County efforts to react to and influence the processes, policies and projects created or proposed by the Comprehensive Water Package have increased greatly.

The County has engaged with local, State and Federal agencies, public entities, State and Federal legislators, environmental groups, and private businesses on several fronts to make certain that the County's position and interests would be represented in any action or policy affecting the Delta. A summary of activities over the last year include those of the Delta Stewardship Council, Delta Conservancy, Delta Protection Commission, Bay Delta Conservation Plan, Delta Counties Coalition, State and Federal legislation, and other coalitions is presented in a Staff Report.

FISCAL IMPACT:

For Fiscal Year 2011-12, the Board allocated \$800,000 to the Delta Activities budget. The allocation was in part intended to cover costs of the Department of Public Works and other County Departments including the County Administrator's Office, Agricultural Commissioner's Office, Community Development, County Counsel, and Office of Emergency Services, for costs related to the Delta along with other water related activities.

Through March 31, 2012, the Delta Activities budget expenditures total \$424,624, with a remaining balance of \$375,376. Costs for the remainder of the Fiscal Year are projected to be within the budget allocation.

ACTION FOLLOWING APPROVAL:

County staff will continue to represent and advocate for San Joaquin County's positions on and interest in issues affecting the Sacramento-San Joaquin Delta consistent with Board of Supervisors policy direction, as adopted in the San Joaquin County State and Federal Legislative Platforms and other adopted resolutions.

Sincerely,

  
THOMAS M. GAU  
Director of Public Works

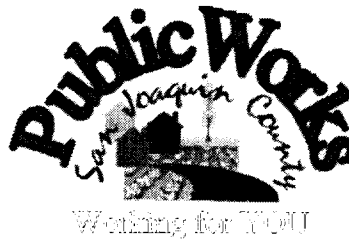
TMG:BN:rc  
WR-12D038-R2

c: County Administrator's Office

Board Clerk  
May 8, 2012 Agenda



THOMAS M. GAU  
DIRECTOR



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BUSINESS ADMINISTRATOR

## STAFF REPORT

### UPDATE ON SACRAMENTO-SAN JOAQUIN DELTA ACTIVITIES APRIL 24, 2012

Dear Board Members:

#### IT IS RECOMMENDED:

That the Board of Supervisor accept the Staff Report Update on Sacramento-San Joaquin Delta Activities.

#### REASONS FOR RECOMMENDATION:

Consistent with Board of Supervisors' policy direction, County staff has worked to represent the County's position, defend County interests, and constructively participate in many of the ongoing State and Federal activities surrounding the Delta. Since the passage of the Comprehensive Water Package, including the Delta Reform Act of 2009, the need for County efforts to react to and influence the processes, policies and projects created or proposed by the Comprehensive Water Package have increased greatly.

The following Staff Report is organized to update the Board of Supervisors on the activities that the County has participated in since the beginning of the current year. The **Coalition Updates** section describes the various Coalitions that the County is actively participating in, including the Partnership for the San Joaquin Valley, the Delta Counties Coalition (DCC), the Delta Coalition led by the Mayor of the City of Stockton, and Coalition for Delta Projects. The next section, **Delta Activities Updates**, describes the major undertakings and activities that the County has participated in related to the Comprehensive Water Package, and a staff recommendation on the strategic importance of additional engagement.

#### **Coalition Updates**

##### Delta Counties Coalition

The County, along with the Delta Counties of Contra Costa, Sacramento, Solano, and Yolo, have formed the DCC to collectively advocate with one voice with regards to Delta activities on behalf of the four million residents of the Delta, and will continue to work cooperatively through common issues such as governance, land use, and water supply and quality impacts to the Delta and its communities. On June 24, 2008, the Board of Supervisors

adopted a Multi-County Resolution (R-08-363) affirming the 11 principles of the 5-Delta Counties and in 2010, reaffirmed those principles and adopted a 12th common principle (R-10-409). The DCC has become an effective voice for Delta interests at the local, State and Federal levels.

Most recently, during the week of March 19, 2012, the DCC sponsored a joint trip to Washington D.C. to advocate DCC principles to the California Congressional and Senatorial delegation, as well as staff of Federal agencies with a major stake in the Delta. The County was represented by Supervisors Ruhstaller and Vogel, the Ferguson Group, and County staff.

California Partnership for the San Joaquin Valley

The California Partnership for the San Joaquin Valley (Partnership) was established by Gubernatorial Executive Order in 2006, to focus attention on one of the most vital, yet challenged regions of the State and implement changes that would improve the economic well-being of the eight San Joaquin Valley Counties, and the quality of life of its residents. The eight San Joaquin Valley Counties include Tulare, Kings, Kern, Fresno, Merced, Tuolumne, Stanislaus, and San Joaquin. Supervisor Ornellas was appointed to the Partnership Board of Directors by Governor Schwarzenegger. The Partnership and the Partnership Water Work Group have worked over the past several years to define the areas of agreement between the eight Counties, rather than focus on areas of disagreement. This collaboration has culminated into the adoption by the full Board of the Partnership a Resolution in support of the Partnership sponsored Integrated Regional Water Management Plan Framework on October 22, 2009.

Recognizing that additional support from areas north of the San Joaquin Valley and the unique position San Joaquin County holds as a bridge between the Delta Counties and the Partnership, both the DCC and Partnership have mutually engaged in a collaborative dialogue to bring together these vital regions with their perspectives and interests to develop a shared vision on actions to help safeguard a sustainable Delta for future generations while ensuring the economic and environmental well-being and an improved quality of life for all Delta and Valley residents. On October 25, 2011, the Partnership adopted a resolution Supporting Proactive Actions to Safeguard a Sustainable Sacramento-San Joaquin Delta. The San Joaquin County Board of Supervisors subsequently adopted the Resolution (R-12-01) on January 10, 2012, as has all four of the other Delta Counties in the DCC.

At the January 20, 2012, meeting of the 12 Delta and San Joaquin Valley County Supervisors, there was preliminary agreement on a number of water projects considered to be beneficial both locally and to the entire region. Currently, the Valley Partnership list includes the Mokelumne River Regional Water Storage and Conjunctive Use Project (MORE WATER), and the South Delta Improvements Program, which proposes to install temporary barriers to improve South Delta water levels and water quality for agriculture. The DCC list of immediate action projects is attached (see handout). The next meeting of the DCC and San Joaquin Valley County Supervisors has been scheduled for May 23, 2012, for the purpose of finalizing a joint list of projects that all 12 Counties can support.

A jointly developed list of projects supported by all 12 Counties may facilitate delivery of and create funding opportunities for the Projects.

*Delta Coalition (Mayor's Initiative)*

Agencies within the County have officially organized into the Delta Coalition under the City of Stockton Mayor's Initiative, which includes the County, the seven incorporated Cities within the County, the San Joaquin Council of Governments, the Port of Stockton, and a number of other agencies representing public, private, agricultural, and environmental interests. The Delta Coalition is primarily focused on possible negative impacts of the Delta Plan's "Covered Actions" on land use activities in the County and the detrimental effects of the Bay Delta Conservation Plan (BDCP) to local area water supplies, water quality, fisheries, agriculture, wildlife and habitat friendly agriculture, local habitat mitigation bank opportunities, and the overall economic viability of the greater San Joaquin County and Delta Region.

The Delta Coalition, on April 9, 2012, adopted the Delta Coalition Principles and Position document and also maintains a website at <http://deltacoalition.org/>. The Mayor of Stockton has also requested that the County participate in the Delta Coalition financially, which was the subject of a related staff recommendation on the May 1, 2012, Board of Supervisors Agenda. The estimated contribution level from the County is \$2,000 per month for the period of February through September, totaling \$16,000. The Delta Coalition Business Plan is currently being prepared for consideration by the full Delta Coalition.

*Coalition to Support Delta Projects*

The Coalition to Support Delta Projects is a grass roots effort started by Delta water interests for the purpose of identifying, selecting and supporting near-term, no-risk or low-risk, and feasible Delta Projects that do not prejudice the outcome of the BDCP or the Delta Stewardship Plan. The first of six meetings was held on April 4, 2012, in Sacramento. The process for moving the Coalition to Support Delta Projects is collaborative and includes facilitation support by the Sacramento State University based Center for Collaborative Policy. Supervisor Ruhstaller and County staff attended the initial meeting, which was well attended and included representatives from the San Joaquin Valley, the greater East Bay and South Bay, Southern California, in-Delta interests from the agricultural, sport fishing and business communities, and several State and Federal Agencies with regulatory and Delta export operations responsibilities.

To be considered for support, project proponents must submit to the Coalition a formatted project description and proposal by May 15, 2012, in advance of the May 23, 2012, second meeting. The County is collaborating with the San Joaquin Area Flood Control Agency, local reclamation districts and water agencies, and the DCC on projects that would be submitted to the Coalition for Delta Projects. Projects could potentially include levee rehabilitation/strengthening, levee armoring along critical through-Delta conveyance channels (Middle River), maintenance dredging, Lower San Joaquin River Bypass Project, and the Smith Canal Gate Closure Structure. Should this Coalition be successful, County

Delta interests could potentially be rewarded with remaining monies in Flood and Water Bond Propositions 1E and 84, proceeds from future bond initiatives, or additional Federal financial support.

### **Delta Activities Updates**

#### **Delta Protection Commission**

The Delta Protection Commission (DPC) was created in 1992 to adaptively protect, maintain, and where possible, enhance and restore the overall quality of the Delta environment consistent with the Delta Protection Act, and the Land Use and Resource Management Plan for the Primary Zone. This includes, but is not limited to, agriculture, wildlife habitat, and recreational activities. The goal of the DPC is to ensure orderly, balanced conservation and development of Delta land resources and improved flood protection. A member from each of the Board of Supervisors of the 5-Delta Counties is seated on the DPC.

As part of the Delta Reform Act of 2009, the Legislature established that the DPC prepare and adopt an Economic Sustainability Plan (ESP) and would include information and recommendations that would inform the Delta Stewardship Council's (DSC) policies regarding socioeconomic sustainability policies for the Delta region. The ESP includes public safety proposals such as flood protection recommendations; recommendations to the Department of Water Resources concerning periodic updates of the flood management plan for the Delta; recommendations on continued socioeconomic sustainability of agriculture, infrastructure, and legacy communities in the Delta; identification of methods to encourage recreational investment along the key river corridors; and recommendations on water conveyance, habitat creation, levees, and land use regulation as it relates to the BDCP and the DSC's Delta Plan.

The October 25, 2011, adopted final draft of the DPC ESP, which was developed by experts, peer reviewed, and widely circulated for public comment, has been a key document for the DCC and the County. The adopted ESP concluded that the impacts of current BDCP and Delta Plan proposals for new water supply and ecosystem restoration projects have serious implications for economic sustainability in the Delta. The ESP concludes that through-Delta conveyance bolstered with modest investments in the Delta levee systems are the most cost-effective strategies for economic sustainability in the Delta. The ESP further concludes that through-Delta conveyance is a more feasible and realistic path to achieving the co-equal goals than plans that are built around large isolated water conveyance facilities and the conversion of Delta agricultural lands to habitat. Staff recommends continued circulation and support of the Delta Protection Commission Economic Sustainability Plan as a key document to be seriously considered in the DSC's Delta Plan and the Bay-Delta Conservation Plan.

Delta Stewardship Council

The Delta Reform Act of 2009 created the DSC with the mission to achieve the co-equal goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem. The co-equal goals are to be achieved in a manner that protects and enhances the unique cultural, recreational, natural resource, and agricultural values of the Delta as an evolving place. The DSC, by statute, must adopt and implement a comprehensive management plan for the Sacramento-San Joaquin Delta by January 1, 2012. This Delta Plan is intended to guide State and local agencies to help achieve the co-equal goals adopted by the Legislature.

In early 2011, the DSC embarked on an aggressive and optimistic schedule of releasing seven consecutive drafts of the Delta Plan with the intent of issuing a draft Programmatic Environmental Impact Report (EIR) based on the fifth draft. On August 2, 2011, the DSC released the fifth Delta Plan draft, and subsequently released the accompanying Programmatic EIR on November 4, 2011. The County, in partnership with the City of Stockton and other Delta Coalition Members, submitted 96 pages of comments to the DSC on the Program EIR. Additionally, written comments were provided by over 200 entities totaling approximately 5,100 pages.

DSC staff has indicated that the responses to comments are currently being drafted for incorporation into the final EIR. It is also widely considered that the DSC may be putting out a sixth Delta Plan draft and even possibly revising the draft EIR for recirculation and comment by the public. Conflicting unconfirmed reports on the timing of the document releases range from the spring of 2012 for the final Environmental Impact Report to April or June 2012, for the sixth Delta Plan draft.

Sacramento-San Joaquin Delta Conservancy

The Sacramento-San Joaquin Delta Conservancy (Conservancy) was created through the Comprehensive Water Package of 2009 to work collaboratively and in cooperation with local communities, and establish partnerships to protect, preserve, enhance and restore the Delta's environment, agriculture and working landscapes, heritage, property, regional economy and increase opportunities for tourism and environmental education for the benefit of the Delta region, its communities and the citizens of California. Supervisor Vogel is the Vice Chairman of the Conservancy Board

By statute, the Conservancy must prepare and adopt a strategic plan to achieve the goals of the Conservancy and must also be consistent with the following plans and laws:

- The Delta Stewardship Council's Delta Plan.
- The Delta Protection Commission's Land Use and Resource Management Plan for the Primary Zone of the Delta.
- The Central Valley Flood Protection Plan.



- The Habitat Management, Preservation and Restoration Plan for the Suisun Marsh.
- The Suisun Marsh Preservation Act of 1977.

The Conservancy has developed a preliminary Draft Strategic Plan and held three Public Work Sessions in April throughout the Delta to solicit public input. Adoption of the Strategic Plan is scheduled for June 27, 2012. The Preliminary Draft Strategic Plan can be found at the Sacramento-San Joaquin Delta Conservancy's website at:

[http://www.deltacconservancy.ca.gov/strategic\\_plan/sp\\_overview.html](http://www.deltacconservancy.ca.gov/strategic_plan/sp_overview.html).

#### Bay-Delta Conservation Plan (BDCP)

The BDCP is a conservation plan intended to meet co-equal goals of "providing a more reliable supply of water and protecting, restoring, and enhancing the Delta ecosystem. The coequal goals shall be achieved in a manner that protects and enhances the unique cultural, recreational, natural resources, and agricultural values of the Delta as an evolving place" (California Water Code Section 85054). The California Natural Resources Agency, acting as the lead State Agency for the State and Federal Water Contractors who desire more reliable Delta exports, is developing an Environmental Impact Report/Environmental Impact Statement in accordance with the California Environmental Quality Act and the National Environmental Policy Act. The Public Draft Environmental Impact Report/Environmental Impact Statement is expected to be available for review and comment in June 2012.

The most recent BDCP documents describe the BDCP Environmental Review Process as having considered 15 action alternatives and the no-action alternative. These various alternatives, except for two, are based on the construction of an isolated conveyance facility. All alternatives are fundamentally flawed in the concept that water exported from the Delta can be mitigated for with investments in ecosystem restoration efforts that would create tidal, marsh and/or shallow water habitat in as much as 113,000 acres depending on the alternative. The fundamental BDCP premise ignores the most basic concepts of fisheries management, which dictates that fish like Delta Smelt and Chinook Salmon need water to thrive. Despite the requests of the County and other Delta interests, the BDCP has not evaluated in detail alternatives to isolated conveyance that are more cost effective, reduce impacts to Delta fish and wildlife, minimize impacts to Delta communities, and achieve the co-equal goals.

The financing strategy of the BDCP will likely burden the general taxpayer as opposed to the beneficiaries, namely the State and Federal Water Contractors, with the cost of acquiring and maintaining BDCP habitat. Assembly Bill 2421, proposed by Assemblyman Berryhill, would require a full cost-benefit analysis of the BDCP. The County and the Delta Counties Coalition have advocated for the full analysis to illuminate the true costs to the general taxpayer of the BDCP, as well as the cost of Bay Delta Conservation Plan impacts on Delta communities.

Board of Supervisors  
STAFF REPORT  
DELTA ACTIVITIES

-7-

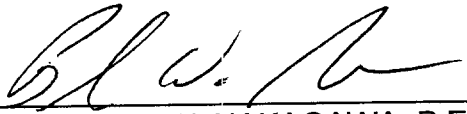
FISCAL IMPACT:

Costs associated with the recommended actions are funded by the Delta Activities Budget.

ACTION FOLLOWING APPROVAL:

County staff will continue to represent and advocate for San Joaquin County's positions on and interest in issues affecting the Sacramento-San Joaquin Delta consistent with Board of Supervisors policy direction, as adopted in the San Joaquin County State and Federal Legislative Platforms and other adopted resolutions.

Prepared by:



BRANDON W. NAKAGAWA, P.E.  
Interim Water Resources Division Manager

Date:

4/24/12

## **DELTA COUNTIES COALITION**

### **IMMEDIATE ACTION PROJECTS that provide improved water quality, water supply reliability, levees and ecosystem improvements**

**(NOTE: Each project should undergo full environmental review and be pursued in partnership with the local community)**

Posted October 1, 2010 DCC

Affirmed July 25, 2011 DCC/CPSJV

#### **PROJECT #1:**

##### **Levee Improvements, Emergency Preparedness and Dredging**

This composite project includes levee improvements in the western Delta islands, emergency preparedness in advance of levee failures, and dredging in Delta channels to improve flood-flow conveyance and operation of agricultural siphons and pumps. Details are provided below.

- Levee improvements on the western Delta islands (Sherman, Twitchell, Jersey Islands which are publicly owned and other critical islands such as Bethel, Hotchkiss, Bradford) for protecting water supplies and the ecosystem, and on key infrastructure islands (Victoria Island with State Route 4 and water facilities, Jones Tract and Woodward Island with water supply facilities and railroads, Sherman with State Route 160)
- Establish more emergency supplies on island sites in case of levee failures, including stockpiles of rock suitable for levee repair at strategic locations.
- Emergency Planning: Desktop and full field emergency exercises among state and local agencies
- Streamline the process used by the Department of Water Resources to administer the Delta Levee Subventions and Special Projects Programs
- Dredge Delta shipping channels to improve flood-flow conveyance and improve operations for private agricultural siphons and pumps, and provide spoils material which could be used to reinforce levees. Dredging would be conducted in the center of channels to avoid impacts to wetland plants and riparian habitat. Dredging would be conducted using either a sealed clamshell dredge or hydraulic dredge in an effort to minimize any environment impacts. The project could be used to evaluate the feasibility of instituting a more comprehensive dredging program throughout the Delta on a period basis.

Project Cost: \$28 Million for dredging component; levee costs to be determined.

## **PROJECT 2#**

### **Improve Techniques for Eradicating Non-Native Submerged and Floating Aquatic Vegetation from Delta Waterways.**

- Non-native invasive Submerged Aquatic Vegetation (SAV) and Floating Aquatic Vegetation (FAV) species have invaded large areas of the Delta and the invasion is continuing to expand and colonize new areas. Removing non-native SAV and FAV from Delta waterways will restore turbidity levels to favor native fisheries such as smelt and salmon.
- The current vegetation removal program administered by Department of Boating and Waterways includes herbicide application and mechanical harvesting. Both of these techniques are limited in their effectiveness for *Egeria Densa*, one of the largest problems in the Delta.
- New techniques or species specific herbicides should be developed to combat *Egeria Densa*. Funding should be provided to support research efforts aimed at eradicating *Egeria Densa*.

## **PROJECT 3#**

### **Pilot Fish Screens at Clifton Court Forebay**

- Demonstration project with a 2,000 cfs positive barrier screened intake on Clifton Court Forebay will provide immediate fish benefits.
- Project will continue to provide benefits in the long term, with or without an isolated facility.
- Would have prevented shutdown of both CVP and SWP pumps in May 2009 due to excessive take at Clifton Court salvage facility.
- August 2009 USFWS study shows delta smelt losses and take is 5 to 200 times worse than previously believed in Clifton Court Forebay, making pumps more vulnerable than ever to shutdowns due to take.
- The Metropolitan Water District, Contra Costa Water District, Santa Clara Valley Water District, Alameda County Water District, and Zone 7 Water Agency are currently conducting a Study to Develop Alternatives for Pilot Fish Screens.
- Results from study should be available by the end of 2010 and if those results are positive, implementation should be the next step.

## **PROJECT 4#**

### **Lower San Joaquin River Regional Bypass**

- Paradise Cut is a federal flood control bypass which was designed to carry up to 15,000 cfs of flood waters away from the urban areas along the San Joaquin River. It is currently the only bypass in the South Delta and connects the San Joaquin River to Grant Line Canal. The bypass was designed to divert flows in the San Joaquin River which exceed a four year storm, but due to sedimentation, the bypass currently carries only a maximum of 10,500 cfs which is less than the design flow. This proposed project involves improvements to Paradise Cut which

will help to restore design flows in the Paradise Cut bypass and also expand it to accommodate additional bypass flows. The project would involve:

- Removing sediment which currently blocks the rock weir and reduces the bypass capacity;
- Setting back levees along the north side of Paradise Cut and creating significant sustainable riparian habitat for an endangered riparian brush rabbit;
- Widening of existing Paradise Weir from 180 feet wide to 400 feet by constructing a 220 foot wide weir adjacent to the existing one;
- Constructing of an additional 500 foot weir at some location upstream of the Paradise Weir or widening of the existing Paradise Weir to an ultimate 900 feet;
- Construction of a bypass channel by excavating a shallow (0 to 10 foot deep) channel to establish positive flow to and into Paradise Cut and construction of 15 to 20 foot high levees on either side;
- Connection of a new channel to a widened Paradise Cut which would set back the southern levees in Paradise Cut by approximately 1,000 feet;
- Dredging of Salmon Slough and Doughty Cut as an optional component, to decrease downstream flooding impacts that could be created from increases in flood waters flowing over the widened additional weirs; and,
- Creation of flood storage areas as an optional component to decrease peak flood events and to allow for queuing of flood flows into the proposed channels and into Paradise Cut, minimizing downstream flooding impacts.

## **PROJECT 5#**

### **Suisun Marsh Restoration**

- Restore 7,000 acres of brackish tidal habitat in the Suisun Marsh in coordination with the Suisun Marsh Habitat Restoration and Management Plan.
- This project will increase rearing habitat area for Chinook salmon, Sacramento split tail, and possibly steelhead and increase the local production of food for rearing salmonids, split tail
- This project will also increase the availability and production of food in Suisun Bay for delta and long fin smelt.

**From:** Jason Peltier

**Sent:** Friday, May 11, 2012 12:39 PM

**To:** Joe Findaro; David Bernhardt; Ed Manning; Carolyn Jensen (cjensen@ka-pow.com)

**Subject:** FW: Senate Strategy on H.R. 1837

**Attachments:** image001.jpg; ATT00001..htm; WEST Act.pdf; ATT00002..htm; HR 1837 Redline of the WEST Act Changes.docx; ATT00003..htm

Begin forwarded message:

**From:** "Nelson, Damon" <[Damon.Nelson@mail.house.gov](mailto:Damon.Nelson@mail.house.gov)>  
**To:** "Walthall, Brent" <[bwalthall@kcwa.com](mailto:bwalthall@kcwa.com)>, "Stuart Somach ([ssomach@somachlaw.com](mailto:ssomach@somachlaw.com))" <[ssomach@somachlaw.com](mailto:ssomach@somachlaw.com)>, "Thomas Birmingham ([tbirmingham@westlandswater.org](mailto:tbirmingham@westlandswater.org))" <[tbirmingham@westlandswater.org](mailto:tbirmingham@westlandswater.org)>, "Gary Sawyers ([gsawyers@sawyerslaw.com](mailto:gsawyers@sawyerslaw.com))" <[gsawyers@sawyerslaw.com](mailto:gsawyers@sawyerslaw.com)>, "Jeff Sutton ([jsutton@tccanal.com](mailto:jsutton@tccanal.com)) ([jsutton@tccanal.com](mailto:jsutton@tccanal.com))" <[jsutton@tccanal.com](mailto:jsutton@tccanal.com)>, "Tim O'Laughlin" <[towater@olaughlinparis.com](mailto:towater@olaughlinparis.com)>, "Einar Maisch" <[elmaisch@pcwa.net](mailto:elmaisch@pcwa.net)>, "Steve Chedester" <[stevechedester@sjrecwa.net](mailto:stevechedester@sjrecwa.net)>  
**Cc:** "Harley, Derek" <[Derek.Harley@mail.house.gov](mailto:Derek.Harley@mail.house.gov)>, "Larrabee, Jason" <[Jason.Larrabee@mail.house.gov](mailto:Jason.Larrabee@mail.house.gov)>, "Hanretty, Ryan" <[Ryan.Hanretty@mail.house.gov](mailto:Ryan.Hanretty@mail.house.gov)>, "Wiseman, Sandra" <[Sandra.Wiseman@mail.house.gov](mailto:Sandra.Wiseman@mail.house.gov)>, "Glenn, Kristen" <[Kristen.Glenn@mail.house.gov](mailto:Kristen.Glenn@mail.house.gov)>, "Weaver, Kiel" <[Kiel.Weaver@mail.house.gov](mailto:Kiel.Weaver@mail.house.gov)>, "Lombardi, Kyle" <[Kyle.Lombardi@mail.house.gov](mailto:Kyle.Lombardi@mail.house.gov)>, "Amaral, Johnny" <[Johnny.Amaral@mail.house.gov](mailto:Johnny.Amaral@mail.house.gov)>, "Nelson, Damon" <[Damon.Nelson@mail.house.gov](mailto:Damon.Nelson@mail.house.gov)>  
**Subject:** Senate Strategy on H.R. 1837

All,

We have been working with our Senate allies on a legislative strategy that will move things forward independent of our two California Senators. The Congressman has had a number of private meetings over the past couple of months with a number of Republican Senators whom have expressed an interest in being California's Republican Senator.

As a result of those meetings, the Senate Western Caucus led by Senator Orin Hatch (R-UT) have introduced the WEST Act (S. 2365 – co-authored by Senators Barrasso, Crapo, Enzi, Moran, and Risch). This legislation is a compilation of bills that have passed the House of Representatives that will create jobs in the West. Included in the 94 page bill is the text of the 52 page H.R. 1837. As you can see in the attached bill, an overwhelming majority of the WEST Act is on California water.

In the process of putting the bill together, the Senate Legislative Counsel (which is a different person than the House Legislative Counsel) felt it necessary to reorganize the text of H.R. 1837. We do not believe that any substantive changes have been made to the bill – but more of a wholesale reorganization, spelling and grammar edits. Senate Legislative Counsel says the new version is a much better product than what the House Legislative Counsel produced.

With that, I have attached a redline version of H.R. 1837 as passed by the House. This will show you the changes that were made by Senate Legislative Counsel. We seek your review of the new version. While it has already been introduced, we want to make sure the text is still in line with the negotiated agreements on H.R. 1837. If this new version is ok with you, then we will use

that text when it comes time to move the bill in the Senate. If there are necessary edits, please let me know so we can make those changes as we move our Senate strategy forward.

If I have missed anyone on this email, please forward it. Thank you.

Damon

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Damon Nelson  
Deputy Chief of Staff & Legislative Director  
Congressman Devin Nunes  
Office: (202) 225-2523

Office Mission: To ensure our constituents and all Americans live free and prosperous lives in a healthy and safe environment by serving, communicating, protecting and representing them in a professional and caring manner.

[\[cid:image001.jpg@01CD2E9A.AE081920\]](cid:image001.jpg@01CD2E9A.AE081920) <<http://itunes.apple.com/us/app/u.s.-representative-devin/id468180651?mt=8>>





112TH CONGRESS  
2D SESSION

**S.**

To promote the economic and energy security of the United States, and  
for other purposes.

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IN THE SENATE OF THE UNITED STATES

Mr. HATCH (for himself and Mr. BARRASSO) introduced the following bill;  
which was read twice and referred to the Committee on

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**A BILL**

To promote the economic and energy security of the United  
States, and for other purposes.

1       *Be it enacted by the Senate and House of Representa-*  
2       *tives of the United States of America in Congress assembled,*

3       **SECTION 1. SHORT TITLE; TABLE OF CONTENTS.**

4       (a) SHORT TITLE.—This Act may be cited as the  
5       “Western Economic Security Today Act” or the “WEST  
6       Act”.

7       (b) TABLE OF CONTENTS.—The table of contents of  
8       this Act is as follows:

Sec. 1. Short title; table of contents.

TITLE I—PUTTING THE GULF OF MEXICO BACK TO WORK

## 2

Sec. 101. Short title.

Sec. 102. Definitions.

Subtitle A—Outer Continental Shelf Land

Sec. 111. Drilling permits.

Subtitle B—Judicial Review of Agency Actions Relating to Outer Continental Shelf Activities in Gulf of Mexico

Sec. 122. Exclusive venue for certain civil actions relating to covered energy projects in Gulf of Mexico.

Sec. 123. Time limitation on filing.

Sec. 124. Expedition in hearing and determining action.

Sec. 125. Standard of review.

Sec. 126. Limitation on prospective relief.

Sec. 127. Limitation on attorneys' fees.

TITLE II—RESTARTING AMERICAN OFFSHORE LEASING NOW

Sec. 201. Short title.

Sec. 202. Definitions.

Sec. 203. Requirement to conduct proposed oil and gas Lease Sale 216 in Central Gulf of Mexico.

Sec. 204. Requirement to conduct proposed oil and gas Lease Sale 220 on Outer Continental Shelf offshore Virginia.

Sec. 205. Requirement to conduct proposed oil and gas Lease Sale 222 in Central Gulf of Mexico.

TITLE III—REVERSING PRESIDENT OBAMA'S OFFSHORE MORATORIUM

Sec. 301. Short title.

Sec. 302. Outer Continental Shelf leasing program.

Sec. 303. Domestic oil and natural gas production goal.

TITLE IV—JOBS AND ENERGY PERMITTING

Sec. 401. Short title.

Sec. 402. Air quality measurement.

Sec. 403. OCS source.

Sec. 404. Permits.

TITLE V—SACRAMENTO-SAN JOAQUIN VALLEY WATER RELIABILITY

Sec. 501. Short title.

Subtitle A—Central Valley Project Water Reliability

Sec. 511. Amendment to purposes.

Sec. 512. Amendment to definition.

Sec. 513. Contracts.

Sec. 514. Water transfers, improved water management, and conservation.

Sec. 515. Fish, wildlife, and habitat restoration.

Sec. 516. Restoration Fund.

Sec. 517. Additional authorities.

Sec. 518. Bay-Delta Accord.

## 3

- Sec. 519. Natural and artificially spawned species.
- Sec. 520. Authorized service area.
- Sec. 521. Regulatory streamlining.

#### Subtitle B—San Joaquin River Restoration

- Sec. 531. Repeal of the San Joaquin River settlement.
- Sec. 532. Purpose.
- Sec. 533. Definitions.
- Sec. 534. Implementation of restoration.
- Sec. 535. Disposal of property; title to facilities.
- Sec. 536. Compliance with applicable law.
- Sec. 537. Compliance with Central Valley Project Improvement Act.
- Sec. 538. No private right of action.
- Sec. 539. Implementation.
- Sec. 540. Repayment contracts and acceleration of repayment of construction costs.
- Sec. 541. Repeal.
- Sec. 542. Water supply mitigation.
- Sec. 543. Additional authorities.

#### Subtitle C—Repayment Contracts and Acceleration of Repayment of Construction Costs

- Sec. 551. Repayment contracts and acceleration of repayment of construction costs.

#### Subtitle D—Bay-Delta Watershed Water Rights Preservation and Protection

- Sec. 561. Water rights and area-of-origin protections.
- Sec. 562. Sacramento River settlement contracts.
- Sec. 563. Sacramento River Watershed water service contractors.
- Sec. 564. No redirected adverse impacts.

#### Subtitle E—Miscellaneous

- Sec. 571. Precedent.

### TITLE VI—REDUCING REGULATORY BURDENS

- Sec. 601. Short title.
- Sec. 602. Use of authorized pesticides.
- Sec. 603. Discharges of pesticides.

### TITLE VII—FARM DUST REGULATION PREVENTION

- Sec. 701. Short title.
- Sec. 702. Temporary prohibition against revising any national ambient air quality standard applicable to coarse particulate matter.
- Sec. 703. Nuisance dust.
- Sec. 704. Sense of Congress.
- Sec. 705. Impacts of EPA regulatory activity on employment and economic activity in agriculture community.

### TITLE VIII—ENERGY TAX PREVENTION

- Sec. 801. Short title.

Sec. 802. No regulation of emissions of greenhouse gases.

Sec. 803. Preserving one national standard for automobiles.

# **1 TITLE I—PUTTING THE GULF OF 2 MEXICO BACK TO WORK**

## **3 SEC. 101. SHORT TITLE.**

4 This title may be cited as the “Putting the Gulf of  
5 Mexico Back to Work Act”.

## **6 SEC. 102. DEFINITIONS.**

7 In this title:

8 (1) COVERED CIVIL ACTION.—The term “cov-  
9 ered civil action” means a civil action containing a  
10 claim under section 702 of title 5, United States  
11 Code, regarding agency action (as defined for the  
12 purposes of that section) affecting a covered energy  
13 project in the Gulf of Mexico.

14 (2) COVERED ENERGY PROJECT.—

15 (A) IN GENERAL.—The term “covered en-  
16 ergy project” means the leasing of Federal land  
17 of the outer Continental Shelf for the explo-  
18 ration, development, production, processing, or  
19 transmission of oil, natural gas, wind, or any  
20 other source of energy in the Gulf of Mexico,  
21 and any action under a lease.

22 (B) EXCLUSION.—The term “covered en-  
23 ergy project” does not include any dispute be-  
24 tween the parties to a lease regarding the obli-

1           gations under the lease, including any alleged  
2           breach of the lease.

3           (3) SECRETARY.—The term “Secretary” means  
4           the Secretary of the Interior.

5           **Subtitle A—Outer Continental**  
6           **Shelf Land**

7   **SEC. 111. DRILLING PERMITS.**

8           Section 11 of the Outer Continental Shelf Lands Act  
9   (43 U.S.C. 1340) is amended by striking subsection (d)  
10   and inserting the following:

11       “(d) DRILLING PERMITS.—

12           “(1) IN GENERAL.—The Secretary shall by reg-  
13       ulation require that any lessee operating under an  
14       approved exploration plan—

15           “(A) obtain a permit before drilling any  
16       well in accordance with the plan; and

17           “(B) obtain a new permit before drilling  
18       any well of a design that is significantly dif-  
19       ferent than the design for which the existing  
20       permit was issued.

21           “(2) SAFETY REVIEW REQUIRED.—The Sec-  
22       retary shall not issue a permit under paragraph (1)  
23       without ensuring that the proposed drilling oper-  
24       ations meet all—

1           “(A) critical safety system requirements,  
2 including blowout prevention; and

3           “(B) oil spill response and containment re-  
4 quirements.

5           “(3) TIMELINE.—

6           “(A) IN GENERAL.—The Secretary shall  
7 determine whether to issue a permit under  
8 paragraph (1) not later than 30 days after the  
9 date on which the Secretary receives the appli-  
10 cation for a permit.

11           “(B) EXTENSION OF TIME.—

12           “(i) IN GENERAL.—The Secretary  
13 may extend the period in which to consider  
14 an application for a permit for up to 2 pe-  
15 riods of 15 days each if the Secretary has  
16 given written notice of the delay to the ap-  
17 plicant.

18           “(ii) NOTICE.—The notice described  
19 in clause (i) shall—

20           “(I) be in the form of a letter  
21 from the Secretary or a designee of  
22 the Secretary; and

23           “(II) include—

1                   “(aa) the name and title of  
2                   each individual processing the ap-  
3                   plication;

4                   “(bb) the reason for the  
5                   delay; and

6                   “(cc) the date on which the  
7                   Secretary expects to make a final  
8                   decision on the application.

9                   “(4) DENIAL OF APPLICATION.—If the Sec-  
10                  retary denies the application, the Secretary shall  
11                  provide the applicant—

12                  “(A) a written statement that provides  
13                  clear and comprehensive reasons why the appli-  
14                  cation was not accepted and detailed informa-  
15                  tion concerning any deficiency; and

16                  “(B) an opportunity to remedy any defi-  
17                  ciencies.

18                  “(5) FAILURE TO MAKE DECISION WITHIN 60  
19                  DAYS.—If the Secretary does not make a decision on  
20                  the application by the date that is 60 days from the  
21                  date on which the Secretary receives the application,  
22                  the application shall be considered approved.”.

1 **Subtitle B—Judicial Review of**  
2 **Agency Actions Relating to**  
3 **Outer Continental Shelf Activi-**  
4 **ties in Gulf of Mexico**

5 **SEC. 122. EXCLUSIVE VENUE FOR CERTAIN CIVIL ACTIONS**  
6 **RELATING TO COVERED ENERGY PROJECTS**  
7 **IN GULF OF MEXICO.**

8 A covered civil action shall be brought only in a judi-  
9 cial district in the Fifth Circuit unless there is no district  
10 in that circuit in which the action may be brought.

11 **SEC. 123. TIME LIMITATION ON FILING.**

12 A covered civil action is barred unless the action is  
13 filed not later than the date that is 60 days after the date  
14 of the final Federal agency action.

15 **SEC. 124. EXPEDITION IN HEARING AND DETERMINING AC-**  
16 **TION.**

17 A court shall endeavor to hear and determine any  
18 covered civil action as expeditiously as practicable.

19 **SEC. 125. STANDARD OF REVIEW.**

20 (a) IN GENERAL.—In any judicial review of a covered  
21 civil action, administrative findings and conclusions relat-  
22 ing to the challenged Federal action or decision shall be  
23 presumed to be correct.



1 (b) STANDARD.—The presumption described in sub-  
2 section (a) may be rebutted only by a preponderance of  
3 the evidence contained in the administrative record.

4 **SEC. 126. LIMITATION ON PROSPECTIVE RELIEF.**

5 In a covered civil action, a court shall not grant or  
6 approve any prospective relief unless the court finds that  
7 the relief is narrowly drawn, extends no further than nec-  
8 essary to correct the violation of a legal requirement, and  
9 is the least intrusive means necessary to correct that viola-  
10 tion.

11 **SEC. 127. LIMITATION ON ATTORNEYS' FEES.**

12 (a) IN GENERAL.—Sections 504 of title 5 and 2412  
13 of title 28, United States Code, do not apply to a covered  
14 civil action.

15 (b) PAYMENT FROM FEDERAL GOVERNMENT.—No  
16 party to a covered civil action shall receive from the Fed-  
17 eral Government payment for attorneys' fees, expenses,  
18 and other court costs.

19 **TITLE II—RESTARTING AMER-**  
20 **ICAN OFFSHORE LEASING**  
21 **NOW**

22 **SEC. 201. SHORT TITLE.**

23 This title may be cited as the “Restarting American  
24 Offshore Leasing Now Act”.

1 **SEC. 202. DEFINITIONS.**

2 In this title:

3 (1) ENVIRONMENTAL IMPACT STATEMENT FOR  
4 THE 2007-2012 5-YEAR OCS PLAN.—The term “envi-  
5 ronmental impact statement for the 2007–2012 5-  
6 Year OCS plan” means the final environmental im-  
7 pact statement prepared by the Secretary entitled  
8 “Outer Continental Shelf Oil and Gas Leasing Pro-  
9 gram: 2007–2012”, and dated April 2007.

10 (2) MULTISALE ENVIRONMENTAL IMPACT  
11 STATEMENT.—The term “multisale environmental  
12 impact statement” means the environmental impact  
13 statement prepared by the Secretary relating to pro-  
14 posed Western Gulf of Mexico OCS Oil and Gas  
15 Lease Sales 204, 207, 210, 215, and 218, and pro-  
16 posed Central Gulf of Mexico OCS Oil and Gas  
17 Lease Sales 205, 206, 208, 213, 216, and 222, and  
18 dated September 2008.

19 (3) SECRETARY.—The term “Secretary” means  
20 the Secretary of the Interior.

21 **SEC. 203. REQUIREMENT TO CONDUCT PROPOSED OIL AND**  
22 **GAS LEASE SALE 216 IN CENTRAL GULF OF**  
23 **MEXICO.**

24 (a) IN GENERAL.—As soon as practicable, but not  
25 later than 60 days after the date of enactment of this Act,  
26 the Secretary shall conduct offshore oil and gas Lease Sale

1 216 under section 8 of the Outer Continental Shelf Lands  
2 Act (33 U.S.C. 1337) .

3 (b) ENVIRONMENTAL REVIEW.—For the purposes of  
4 the lease sale described in subsection (a), the environ-  
5 mental impact statement for the 2007–2012 5-Year OCS  
6 plan and the multisale environmental impact statement  
7 shall be considered to satisfy the requirements of the Na-  
8 tional Environmental Policy Act of 1969 (42 U.S.C. 4321  
9 et seq.).

10 **SEC. 204. REQUIREMENT TO CONDUCT PROPOSED OIL AND**  
11 **GAS LEASE SALE 220 ON OUTER CONTI-**  
12 **NENTAL SHELF OFFSHORE VIRGINIA.**

13 (a) IN GENERAL.—As soon as practicable, but not  
14 later than 1 year after the date of enactment of this Act,  
15 the Secretary shall conduct offshore oil and gas Lease Sale  
16 220 under section 8 of the Outer Continental Shelf Lands  
17 Act (33 U.S.C. 1337).

18 (b) ENVIRONMENTAL REVIEW.—For the purposes of  
19 the lease sale described in subsection (a), the environ-  
20 mental impact statement for the 2007–2012 5-Year OCS  
21 plan and the multisale environmental impact statement  
22 shall be considered to satisfy the requirements of the Na-  
23 tional Environmental Policy Act of 1969 (42 U.S.C. 4321  
24 et seq.).

1   **SEC. 205. REQUIREMENT TO CONDUCT PROPOSED OIL AND**  
2                           **GAS LEASE SALE 222 IN CENTRAL GULF OF**  
3                           **MEXICO.**

4           (a) IN GENERAL.—As soon as practicable, but not  
5 later than 60 days after the date of enactment of this Act,  
6 the Secretary shall conduct offshore oil and gas Lease Sale  
7 222 under section 8 of the Outer Continental Shelf Lands  
8 Act (33 U.S.C. 1337).

9           (b) ENVIRONMENTAL REVIEW.—For the purposes of  
10 the lease sale described in subsection (a), the environ-  
11 mental impact statement for the 2007–2012 5-Year OCS  
12 plan and the multisale environmental impact statement  
13 shall be considered to satisfy the requirements of the Na-  
14 tional Environmental Policy Act of 1969 (42 U.S.C. 4321  
15 et seq.).

16   **TITLE III—REVERSING PRESI-**  
17           **DENT OBAMA’S OFFSHORE**  
18           **MORATORIUM**

19   **SEC. 301. SHORT TITLE.**

20           This title may be cited as the “Reversing President  
21 Obama’s Offshore Moratorium Act”.

22   **SEC. 302. OUTER CONTINENTAL SHELF LEASING PROGRAM.**

23           Section 18(a) of the Outer Continental Shelf Lands  
24 Act (43 U.S.C. 1344(a)) is amended by adding at the end  
25 the following:

1           “(5)(A) In each oil and gas leasing program  
2           under this section, the Secretary shall make avail-  
3           able for leasing and conduct lease sales that in-  
4           clude—

5                   “(i) at least 50 percent of the available un-  
6           leased acreage within each outer Continental  
7           Shelf planning area considered to have the larg-  
8           est undiscovered, technically recoverable oil and  
9           gas resources (on a total btu basis) based upon  
10          the most recent national geological assessment  
11          of the outer Continental Shelf, with an empha-  
12          sis on offering the most geologically prospective  
13          parts of the planning area; and

14                   “(ii) any State subdivision of an outer  
15          Continental Shelf planning area that the Gov-  
16          ernor of the State that represents that subdivi-  
17          sion requests be made available for leasing.

18           “(B) In this paragraph, the term ‘available un-  
19          leased acreage’ means that portion of the outer Con-  
20          tinental Shelf that is not under lease at the time of  
21          a proposed lease sale, and that has not otherwise  
22          been made unavailable for leasing by law.

23           “(6)(A) For the 2012–2017 5-year oil and gas  
24          leasing program, the Secretary shall make available

1 for leasing any outer Continental Shelf planning  
2 areas that are estimated to contain more than—

3 “(i) 2,500,000,000 barrels of oil; or

4 “(ii) 7,500,000,000,000 cubic feet of nat-  
5 ural gas.

6 “(B) To determine the planning areas described  
7 in subparagraph (A), the Secretary shall use the  
8 document entitled ‘Minerals Management Service  
9 Assessment of Undiscovered Technically Recoverable  
10 Oil and Gas Resources of the Nation’s Outer Conti-  
11 nental Shelf, 2006’.”.

12 **SEC. 303. DOMESTIC OIL AND NATURAL GAS PRODUCTION**

13 **GOAL.**

14 Section 18 of the Outer Continental Shelf Lands Act  
15 (43 U.S.C. 1344) is amended by striking subsection (b)  
16 and inserting the following:

17 “(b) DOMESTIC OIL AND NATURAL GAS PRODUC-  
18 TION GOAL.—

19 “(1) IN GENERAL.—In developing a 5-year oil  
20 and gas leasing program, subject to paragraph (2),  
21 the Secretary shall determine a domestic strategic  
22 production goal for the development of oil and nat-  
23 ural gas as a result of that program, which goal  
24 shall be—

1           “(A) the best estimate of the practicable  
2           increase in domestic production of oil and nat-  
3           ural gas from the outer Continental Shelf;

4           “(B) focused on meeting domestic demand  
5           for oil and natural gas and reducing the de-  
6           pendence of the United States on foreign en-  
7           ergy; and

8           “(C) focused on the production increases  
9           achieved by the leasing program at the end of  
10          the 15-year period beginning on the effective  
11          date of the program.

12          “(2) 2012–2017 PROGRAM GOAL.—For pur-  
13          poses of the 2012–2017 5-year oil and gas leasing  
14          program, the production goal referred to in para-  
15          graph (1) shall be an increase by 2027 of not less  
16          than—

17                 “(A) 3,000,000 barrels in the quantity of  
18                 oil produced per day; and

19                 “(B) 10,000,000,000 cubic feet in the  
20                 quantity of natural gas produced per day.

21          “(3) REPORTING.—Beginning at the end of the  
22          5-year period for which the program applies and an-  
23          nually thereafter, the Secretary shall submit to the  
24          Committee on Natural Resources of the House of  
25          Representatives and the Committee on Energy and

1 Natural Resources of the Senate a report on the  
2 progress of the program in meeting the production  
3 goal that includes an identification of projections for  
4 production and any problems with leasing, permit-  
5 ting, or production that will prevent meeting the  
6 goal.”.

7 **TITLE IV—JOBS AND ENERGY**  
8 **PERMITTING**

9 **SEC. 401. SHORT TITLE.**

10 This title may be cited as the “Jobs and Energy Per-  
11 mitting Act of 2012”.

12 **SEC. 402. AIR QUALITY MEASUREMENT.**

13 Section 328(a)(1) of the Clean Air Act (42 U.S.C.  
14 7627(a)(1)) is amended in the second sentence by insert-  
15 ing before the period at the end the following: “, except  
16 that any air quality impact of any OCS source shall be  
17 measured or modeled, as appropriate, and determined  
18 solely with respect to the impacts in the corresponding on-  
19 shore area”.

20 **SEC. 403. OCS SOURCE.**

21 Section 328(a)(4)(C) of the Clean Air Act (42 U.S.C.  
22 7627(a)(4)(C)) is amended in the second sentence of the  
23 matter following clause (iii) by striking “shall be consid-  
24 ered direct emissions from the OCS source” and inserting  
25 “shall be considered direct emissions from the OCS source



1 but shall not be subject to any emission control require-  
2 ment applicable to the source under subpart 1 of part C  
3 of title I of this Act. For platform or drill ship exploration,  
4 an OCS source is established at the point in time when  
5 drilling commences at a location and ceases to exist when  
6 drilling activity ends at the location or is temporarily in-  
7 terrupted because the platform or drill ship relocates for  
8 weather or other reasons”.

9 **SEC. 404. PERMITS.**

10 (a) PERMITS.—Section 328 of the Clean Air Act (42  
11 U.S.C. 7627) is amended by adding at the end the fol-  
12 lowing:

13 “(d) PERMIT APPLICATION.—In the case of a com-  
14 pleted application for a permit under this Act for platform  
15 or drill ship exploration for an OCS source—

16 “(1) final agency action (including any recon-  
17 sideration of the issuance or denial of such a permit)  
18 shall be taken not later than 180 days after the date  
19 on which the completed application is filed;

20 “(2) the Environmental Appeals Board of the  
21 Environmental Protection Agency shall have no au-  
22 thority to consider any matter regarding the consid-  
23 eration, issuance, or denial of the permit;

24 “(3) no administrative stay of the effectiveness  
25 of the permit may extend beyond the date that is

1 180 days after the date on which the completed ap-  
2 plication is filed;

3 “(4) that final agency action shall be considered  
4 to be nationally applicable under section 307(b); and

5 “(5) judicial review of that final agency action  
6 shall be available only in accordance with section  
7 307(b) without additional administrative review or  
8 adjudication.”.

9 (b) CONFORMING AMENDMENT.—Section 328(a)(4)  
10 of the Clean Air Act (42 U.S.C. 7627(a)(4)) is amended  
11 by striking “For purposes of subsections (a) and (b) of  
12 this section—” and inserting “For purposes of subsections  
13 (a), (b), and (d):”.

14 **TITLE V—SACRAMENTO-SAN**  
15 **JOAQUIN VALLEY WATER RE-**  
16 **LIABILITY**

17 **SEC. 501. SHORT TITLE.**

18 This title may be cited as the “Sacramento-San Joa-  
19 quin Valley Water Reliability Act”.

20 **Subtitle A—Central Valley Project**  
21 **Water Reliability**

22 **SEC. 511. AMENDMENT TO PURPOSES.**

23 Section 3402 of the Central Valley Project Improve-  
24 ment Act (Public Law 102–575; 106 Stat. 4706) is  
25 amended—

1           (1) in subsection (f), by striking the period at  
2           the end; and

3           (2) by adding at the end the following:

4           “(g) to ensure that water dedicated to fish and wild-  
5           life purposes by this title is replaced and provided to Cen-  
6           tral Valley Project water contractors not later than De-  
7           cember 31, 2016, at the lowest cost reasonably achievable;  
8           and

9           “(h) to facilitate and expedite water transfers in ac-  
10          cordance with this title.”.

11   **SEC. 512. AMENDMENT TO DEFINITION.**

12          Section 3403 of the Central Valley Project Improve-  
13          ment Act (Public Law 102–575; 106 Stat. 4707) is  
14          amended—

15               (1) by striking subsection (a) and inserting the  
16               following:

17               “(a) the term ‘anadromous fish’ means those native  
18               stocks of salmon (including steelhead) and sturgeon  
19               that—

20                       “(1) as of October 30, 1992, were present in  
21               the Sacramento and San Joaquin Rivers and the  
22               tributaries of the Sacramento and San Joaquin Riv-  
23               ers; and

1           “(2) ascend those rivers and tributaries to re-  
2           produce after maturing in San Francisco Bay or the  
3           Pacific Ocean;”;

4           (2) by redesignating subsections (i) through  
5           (m) as subsections (j) through (n), respectively; and

6           (3) by inserting after subsection (h) the fol-  
7           lowing:

8           “(i) the term ‘reasonable flows’ means water flows  
9           capable of being maintained taking into account com-  
10          peting consumptive uses of water and economic, environ-  
11          mental, and social factors.”.

12   **SEC. 513. CONTRACTS.**

13          Section 3404 of the Central Valley Project Improve-  
14          ment Act (Public Law 102–575; 106 Stat. 4708) is  
15          amended to read as follows:

16   **“SEC. 3404. CONTRACTS.**

17          “(a) RENEWAL OF EXISTING LONG-TERM CON-  
18          TRACTS.—On request of the contractor, the Secretary  
19          shall renew any existing long-term repayment or water  
20          service contract that provides for the delivery of water  
21          from the Central Valley Project for a period of 40 years.

22          “(b) ADMINISTRATION OF CONTRACTS.—Except as  
23          expressly provided by this title, any existing long-term re-  
24          payment or water service contract for the delivery of water  
25          from the Central Valley Project shall be administered pur-

1 suant to the Act of July 2, 1956 (chapter 492; 70 Stat.  
2 483).

3 “(c) DELIVERY CHARGE.—Beginning on the date of  
4 enactment of this Act, a contract entered into or renewed  
5 pursuant to this section shall include a provision that re-  
6 quires the Secretary to charge any other party to the con-  
7 tract only for water actually delivered by the Secretary.”.

8 **SEC. 514. WATER TRANSFERS, IMPROVED WATER MANAGE-**  
9 **MENT, AND CONSERVATION.**

10 Section 3405 of the Central Valley Project Improve-  
11 ment Act (Public Law 102–575; 106 Stat. 4709) is  
12 amended—

13 (1) in subsection (a)—

14 (A) in the second sentence, by striking  
15 “Except as provided herein” and inserting “The  
16 Secretary shall take all actions necessary to fa-  
17 cilitate and expedite transfers of Central Valley  
18 Project water in accordance with this title or  
19 any other provision of Federal reclamation law  
20 and the National Environmental Policy Act of  
21 1969 (42 U.S.C. 4321 et seq.). Except as pro-  
22 vided in this subsection,”;

23 (B) in paragraph (1)(A), by striking “to  
24 combination” and inserting “or combination”;

1 (C) in paragraph (2), by adding at the end  
2 the following:

3 “(E) WRITTEN TRANSFER PROPOSALS.—

4 “(i) IN GENERAL.—The contracting  
5 district from which the water is supplied,  
6 the agency, or the Secretary, as applicable,  
7 shall determine whether a written transfer  
8 proposal is complete not later than 45 days  
9 after the date on which the proposal is  
10 submitted.

11 “(ii) DETERMINATION.—If the con-  
12 tracting district, the agency, or the Sec-  
13 retary determines that the proposal de-  
14 scribed in clause (i) is incomplete, the con-  
15 tracting district, agency, or Secretary shall  
16 state, in writing and with specificity, the  
17 conditions under which the proposal would  
18 be considered complete.

19 “(F) NO MITIGATION REQUIREMENTS.—

20 “(i) IN GENERAL.—Except as pro-  
21 vided in this section, the Secretary shall  
22 not impose mitigation or other require-  
23 ments on a proposed transfer.

24 “(ii) APPLICABILITY.—This section  
25 shall have no effect on the authority of the

1 contracting district from which the water  
2 is supplied or the agency under State law  
3 to approve or condition a proposed trans-  
4 fer.”; and

5 (D) by adding at the end the following:

6 “(4) APPLICABILITY.—Notwithstanding any  
7 other provision of Federal reclamation law—

8 “(A) the authority to transfer, exchange,  
9 bank, or make recharging arrangements using  
10 Central Valley Project water that could have  
11 been carried out before October 30, 1992, is  
12 valid, and those transfers, exchanges, or ar-  
13 rangements shall not be subject to, limited, or  
14 conditioned by this title; and

15 “(B) this title does not supersede or revoke  
16 the authority to transfer, exchange, bank, or re-  
17 charge Central Valley Project water in effect  
18 before October 30, 1992.”;

19 (2) in subsection (b)—

20 (A) in the heading, by striking “METER-  
21 ING” and inserting “MEASUREMENT”;

22 (B) in the first sentence, by striking “All  
23 Central Valley” and inserting the following:

24 “(1) IN GENERAL.—All Central Valley”;

1 (C) in the second sentence, by striking  
2 “The contracting district” and inserting the fol-  
3 lowing:

4 “(3) ANNUAL REPORT.—The contracting dis-  
5 trict”; and

6 (D) by inserting after paragraph (1) (as  
7 designated by subparagraph (B)) the following:

8 “(2) MEASUREMENT REQUIREMENTS.—The  
9 contracting district or agency, not including con-  
10 tracting districts serving multiple agencies with sep-  
11 arate governing boards, shall ensure that all con-  
12 tractor-owned water delivery systems within the  
13 boundaries of the contracting district or agency  
14 measure surface water at the facilities of the con-  
15 tracting district or agency up to the point at which  
16 the surface water is commingled with other water  
17 supplies.”;

18 (3) by striking subsection (d);

19 (4) by redesignating subsections (e) and (f) as  
20 subsections (d) and (e), respectively; and

21 (5) by striking subsection (e) (as redesignated  
22 by paragraph (4)) and inserting the following:

23 “(e) INCREASED REVENUES.—All revenues received  
24 by the Secretary that exceed the cost-of-service rates ap-  
25 plicable to the delivery of water transferred from irrigation



1 use to municipal and industrial use under subsection (a)  
2 shall be covered to the Restoration Fund.”.

3 **SEC. 515. FISH, WILDLIFE, AND HABITAT RESTORATION.**

4 Section 3406 of the Central Valley Project Improve-  
5 ment Act (Public Law 102–575; 106 Stat. 4714) is  
6 amended—

7 (1) in subsection (b)—

8 (A) by striking paragraph (1)(B) and in-  
9 serting the following:

10 “(B) ADMINISTRATION.—

11 “(i) IN GENERAL.—As needed to  
12 carry out the goals of the Central Valley  
13 Project, the Secretary may modify Central  
14 Valley Project operations to provide rea-  
15 sonable flows of suitable quality, quantity,  
16 and timing to protect all life stages of  
17 anadromous fish.

18 “(ii) REQUIREMENTS.—The flows  
19 under clause (i) shall be provided from the  
20 quantity of water dedicated to fish, wild-  
21 life, and habitat restoration purposes  
22 under paragraph (2) from the water sup-  
23 plies acquired pursuant to paragraph (3)  
24 and from other sources which do not con-  
25 flict with fulfillment of the remaining con-

1           tractual obligations of the Secretary to  
2           provide Central Valley Project water for  
3           other authorized purposes.

4           “(iii) DETERMINATION OF NEEDS.—  
5           The Secretary shall determine the instream  
6           reasonable flow needs for all Central Valley  
7           Project controlled streams and rivers based  
8           on recommendations of the United States  
9           Fish and Wildlife Service and the National  
10          Marine Fisheries Service after consultation  
11          with the United States Geological Sur-  
12          vey.”; and

13          (B) in paragraph (2)—

14                 (i) in the matter preceding subpara-  
15                 graph (A)—

16                         (I) in the first sentence, by strik-  
17                         ing “primary purpose” and inserting  
18                         “purposes”;

19                         (II) by striking “but not limited  
20                         to additional obligations under the  
21                         Federal Endangered Species Act” and  
22                         inserting “additional obligations under  
23                         the Endangered Species Act of 1973  
24                         (16 U.S.C. 1531 et seq.)”; and

1 (III) by adding at the end the  
2 following: “All Central Valley Project  
3 water used for the purposes specified  
4 in this paragraph shall be credited to  
5 the quantity of Central Valley Project  
6 yield dedicated and managed under  
7 this paragraph by determining how  
8 the dedication and management of  
9 that water would affect the delivery  
10 capability of the Central Valley  
11 Project yield. To the maximum extent  
12 practicable and in accordance with  
13 section 3411, Central Valley Project  
14 water dedicated and managed pursu-  
15 ant to this paragraph shall be reused  
16 to fulfill the remaining contractual ob-  
17 ligations of the Secretary to provide  
18 Central Valley Project water for agri-  
19 cultural or municipal and industrial  
20 purposes.”; and

21 (ii) by striking subparagraph (C) and  
22 inserting the following:

23 “(C) MANDATORY REDUCTION.—If on  
24 March 15 of a given year, the quantity of Cen-  
25 tral Valley Project water forecasted to be made

1           available to water service or repayment contrac-  
2           tors in the Delta Division of the Central Valley  
3           Project is less than 75 percent of the total  
4           quantity of water to be made available under  
5           those contracts, the quantity of Central Valley  
6           Project yield dedicated and managed for that  
7           year under this paragraph shall be reduced by  
8           25 percent.”; and

9           (2) by adding at the end the following:

10          “(i) SATISFACTION OF PURPOSES.—In carrying out  
11 this section, the Secretary shall be considered to have met  
12 the mitigation, protection, restoration, and enhancement  
13 purposes of this title.”.

14   **SEC. 516. RESTORATION FUND.**

15          (a) IN GENERAL.—Section 3407(a) of the Central  
16 Valley Project Improvement Act (Public Law 102–575;  
17 106 Stat. 4726) is amended—

18           (1) by striking “There is hereby” and inserting  
19           the following:

20           “(1) ESTABLISHMENT.—

21           “(A) IN GENERAL.—There is”;

22           (2) in paragraph (1)(A) (as designated by para-  
23 graph (1)), by striking “Not less than 67 percent”  
24 and all that follows through “Monies” and inserting  
25           the following:

1                   “(B) USE OF DONATED AMOUNTS.—  
2                   Amounts”; and

3                   (3) by adding at the end the following:

4                   “(2) RESTRICTIONS.—The Secretary may not  
5                   directly or indirectly require a donation or other  
6                   payment (including environmental restoration or  
7                   mitigation fees not otherwise provided by law) to the  
8                   Restoration Fund—

9                   “(A) as a condition of—

10                   “(i) providing for the storage or con-  
11                   veyance of non-Central Valley Project  
12                   water pursuant to Federal reclamation  
13                   laws; or

14                   “(ii) the delivery of water pursuant to  
15                   section 215 of the Reclamation Reform Act  
16                   of 1982 (Public Law 97–293; 96 Stat.  
17                   1270); or

18                   “(B) for any water that is delivered with  
19                   the sole intent of groundwater recharge.”.

20                   (b) CERTAIN PAYMENTS.—Section 3407(c)(1) of the  
21                   Central Valley Project Improvement Act (Public Law  
22                   102–575; 106 Stat. 4726) is amended—

23                   (1) by striking “mitigation and restoration pay-  
24                   ments, in addition to charges provided for or” and  
25                   inserting “payments, in addition to charges”; and

1           (2) by striking “of fish, wildlife” and all that  
2 follows through the period and inserting “of carrying  
3 out this title.”.

4           (c) ADJUSTMENT AND ASSESSMENT OF MITIGATION  
5 AND RESTORATION PAYMENTS.—Section 3407(d) of the  
6 Central Valley Project Improvement Act (Public Law  
7 102–575; 106 Stat. 4727) is amended—

8           (1) in paragraph (2)(A)—

9                 (A) by striking “, and \$12 per acre-foot  
10 (October 1992 price levels) for municipal and  
11 industrial water sold and delivered by the Cen-  
12 tral Valley Project” and inserting “\$12 per  
13 acre-foot (October 1992 price levels) for munic-  
14 ipal and industrial water sold and delivered by  
15 the Central Valley Project, and after October 1,  
16 2013, \$4 per megawatt-hour for Central Valley  
17 Project power sold to power contractors (Octo-  
18 ber 2013 price levels)”;

19                 (B) by inserting “ but not later than De-  
20 cember 31, 2020,” after “That upon the com-  
21 pletion of the fish, wildlife, and habitat mitiga-  
22 tion and restoration actions mandated under  
23 section 3406 of this title,”;

24           (2) by adding at the end the following:

25           “(g) REPORT ON EXPENDITURE OF FUNDS.—

1           “(1) IN GENERAL.—For each fiscal year, the  
2       Secretary, in consultation with the Advisory Board,  
3       shall submit to Congress a plan for the expenditure  
4       of all of the funds deposited in the Restoration Fund  
5       during the preceding fiscal year.

6           “(2) CONTENTS.—The plan shall include an  
7       analysis of the cost-effectiveness of each expenditure.

8       “(h) ADVISORY BOARD.—

9           “(1) ESTABLISHMENT.—There is established  
10      the Restoration Fund Advisory Board (referred to in  
11      this section as the ‘Advisory Board’), which shall be  
12      composed of 12 members appointed by the Sec-  
13      retary.

14          “(2) MEMBERSHIP.—

15           “(A) IN GENERAL.—The Secretary shall  
16      appoint members to the Advisory Board that  
17      represent the various Central Valley Project  
18      stakeholders, of whom—

19           “(i) 4 members shall be agricultural  
20      users of the Central Valley Project;

21           “(ii) 3 members shall be municipal  
22      and industrial users of the Central Valley  
23      Project;

24           “(iii) 3 members shall be power con-  
25      tractors of the Central Valley Project; and

1 “(iv) 2 members shall be appointed at  
2 the discretion of the Secretary.

3 “(B) OBSERVERS.—The Secretary and the  
4 Secretary of Commerce may each designate a  
5 representative to act as an observer of the Advi-  
6 sory Board.

7 “(C) CHAIRMAN.—The Secretary shall ap-  
8 point 1 of the members described in subpara-  
9 graph (A) to serve as Chairman of the Advisory  
10 Board.

11 “(3) TERMS.—The term of each member of the  
12 Advisory Board shall be for a period of 4 years.

13 “(4) DUTIES.—The duties of the Advisory  
14 Board are—

15 “(A) to meet not less frequently than semi-  
16 annually to develop and make recommendations  
17 to the Secretary regarding priorities and spend-  
18 ing levels on projects and programs carried out  
19 under this title;

20 “(B) to ensure that any advice given or  
21 recommendation made by the Advisory Board  
22 reflects the independent judgment of the Advi-  
23 sory Board;

24 “(C) not later than December 31, 2013,  
25 and annually thereafter, to submit to the Sec-



1           retary and Congress the recommendations  
2           under subparagraph (A); and

3                 “(D) not later than December 31, 2013,  
4           and biennially thereafter, to submit to Congress  
5           a report that details the progress made in  
6           achieving the actions required under section  
7           3406.

8                 “(5) ADMINISTRATION.—With the consent of  
9           the appropriate agency head, the Advisory Board  
10          may use the facilities and services of any Federal  
11          agency.”.

12   **SEC. 517. ADDITIONAL AUTHORITIES.**

13          (a) AUTHORITY FOR CERTAIN ACTIVITIES.—Section  
14   3408 of the Central Valley Project Improvement Act  
15   (Public Law 102–575; 106 Stat. 4728) is amended by  
16   striking subsection (c) and inserting the following:

17          “(c) CONTRACTS FOR ADDITIONAL STORAGE AND  
18   DELIVERY OF WATER.—

19                 “(1) IN GENERAL.—The Secretary may enter  
20   into contracts under the reclamation laws and this  
21   title with any Federal agency, California water user  
22   or water agency, State agency, or private organiza-  
23   tion for the exchange, impoundment, storage, car-  
24   riage, and delivery of nonproject water for domestic,

1       municipal, industrial, fish and wildlife, and any  
2       other beneficial purpose.

3           “(2) LIMITATION.—Nothing in this subsection  
4       supersedes section 2(d) of the Act of August 26,  
5       1937 (chapter 832; 50 Stat. 850; 100 Stat. 3051).

6           “(3) AUTHORITY FOR CERTAIN ACTIVITIES.—  
7       The Secretary shall use the authority granted by  
8       this subsection in connection with requests to ex-  
9       change, impound, store, carry, or deliver nonproject  
10      water using Central Valley Project facilities for any  
11      beneficial purpose.

12          “(4) RATES.—

13           “(A) IN GENERAL.—The Secretary shall  
14       develop rates not to exceed the amount required  
15       to recover the reasonable costs incurred by the  
16       Secretary in connection with a beneficial pur-  
17       pose under this subsection.

18           “(B) ADMINISTRATION.—The rates shall  
19       be charged to a party using Central Valley  
20       Project facilities for a beneficial purpose, but  
21       the costs described in subparagraph (A) shall  
22       not include any donation or other payment to  
23       the Restoration Fund.

24           “(5) CONSTRUCTION.—This subsection shall be  
25       construed and implemented to facilitate and encour-

1       age the use of Central Valley Project facilities to ex-  
2       change, impound, store, carry, or deliver nonproject  
3       water for any beneficial purpose.”.

4       (b) REPORTING REQUIREMENTS.—Section 3408(f) of  
5       the Central Valley Project Improvement Act (Public Law  
6       102–575; 106 Stat. 4729) is amended—

7               (1) in the first sentence, by striking “Interior  
8       and Insular Affairs and the Committee on Merchant  
9       Marine and Fisheries” and inserting “Natural Re-  
10      sources”;

11              (2) in the second sentence, by inserting “, in-  
12      cluding progress on the plan under subsection (j)”  
13      before the period at the end; and

14              (3) by adding at the end the following: “The fil-  
15      ing and adequacy of the report shall be personally  
16      certified to the Committees by the Regional Director  
17      of the Mid-Pacific Region of the Bureau of Reclama-  
18      tion.”.

19      (c) PROJECT YIELD INCREASE.—Section 3408(j) of  
20      the Central Valley Project Improvement Act (Public Law  
21      102–575; 106 Stat. 4730) is amended—

22              (1) by redesignating paragraphs (1) through  
23      (7) as subparagraphs (A) through (G), respectively,  
24      and indenting appropriately;

1           (2) by striking “In order to minimize adverse  
2           effects, if any, upon” and inserting the following:

3           “(1) IN GENERAL.—In order to minimize ad-  
4           verse effects upon”;

5           (3) in the second sentence, by striking “The  
6           plan” and all that follows through “options:” and in-  
7           serting the following:

8           “(2) CONTENTS.—The plan shall include rec-  
9           ommendations on appropriate cost-sharing arrange-  
10          ments and authorizing legislation or other measures  
11          needed to implement the intent, purposes, and provi-  
12          sions of this subsection, as well as a description of  
13          how the Secretary intends to use—”;

14          (4) in paragraph (1) (as designated by para-  
15          graph (2))—

16                (A) by striking “needs, the Secretary,  
17                shall” and all that follows through “to the Con-  
18                gress,” and inserting “needs, the Secretary, on  
19                a priority basis and not later than September  
20                30, 2013, shall submit to Congress”; and

21                (B) by striking “increase,” and all that fol-  
22                lows through “under this title” and inserting  
23                “increase, as soon as practicable, but not later  
24                than September 30, 2016 (except that the con-  
25                struction of new facilities shall not be limited by

1           that deadline), the water of the Central Valley  
2           Project by the quantity dedicated and managed  
3           for fish and wildlife purposes under this title  
4           and otherwise required to meet the purposes of  
5           the Central Valley Project, including satisfying  
6           contractual obligations”;

7           (5) in paragraph (2)(A) (as designated by para-  
8           graph (1)), by inserting “and construction of new  
9           water storage facilities” before the semicolon;

10          (6) in paragraph (2)(F) (as designated by para-  
11          graph (1)), by striking “and” at the end;

12          (7) in paragraph (2)(G) (as designated by para-  
13          graph (1)), by striking the period and all that fol-  
14          lows through the end of the subsection and inserting  
15          “; and”; and

16          (8) by adding after paragraph (2)(G) the fol-  
17          lowing:

18                 “(H) water banking and recharge.

19                 “(3) IMPLEMENTATION OF PLAN.—

20                         “(A) IN GENERAL.—The Secretary shall  
21                         implement the plan under paragraph (1) begin-  
22                         ning on October 1, 2013.

23                         “(B) COORDINATION.—In carrying out this  
24                         subsection, the Secretary shall coordinate with  
25                         the State of California in implementing meas-

1           ures for the long-term resolution of problems in  
2           the San Francisco Bay/Sacramento-San Joa-  
3           quin Delta Estuary.

4           “(4) FAILURE OF PLAN.—Notwithstanding any  
5           other provision of the reclamation laws, if by Sep-  
6           tember 30, 2016, the plan under paragraph (1) fails  
7           to increase the annual delivery capability of the Cen-  
8           tral Valley Project by 800,000 acre-feet, implemen-  
9           tation of any nonmandatory action under section  
10          3406(b)(2) shall be suspended until the date on  
11          which the plan achieves an increase in the annual  
12          delivery capability of the Central Valley Project of  
13          800,000 acre-feet.”.

14          (d) TECHNICAL CORRECTIONS.—Section 3408(h) of  
15          the Central Valley Project Improvement Act (Public Law  
16          102–575; 106 Stat. 4729) is amended—

17               (1) in paragraph (1), by striking “paragraph  
18               (h)(2)” and inserting “paragraph (2)”; and

19               (2) in paragraph (2), by striking “paragraph  
20               (h)(i)” and inserting “paragraph (1)”.

21          (e) WATER STORAGE PROJECT CONSTRUCTION.—

22               (1) IN GENERAL.—The Secretary of the Inte-  
23               rior, acting through the Commissioner of Reclama-  
24               tion, may partner or enter into an agreement relat-  
25               ing to the water storage projects described in section

1       103(d)(1) of the Water Supply, Reliability, and En-  
2       vironmental Improvement Act (Public Law 108–361;  
3       118 Stat. 1684) with local joint powers authorities  
4       formed under State law by irrigation districts and  
5       other local governments or water districts within the  
6       applicable hydrological region to advance those water  
7       storage projects.

8               (2) NO ADDITIONAL FEDERAL AMOUNTS.—

9               (A) IN GENERAL.—Subject to subpara-  
10       graph (B), no additional Federal amounts are  
11       authorized to be appropriated to carry out the  
12       activities described in clauses (i) through (iii) of  
13       sections 103(d)(1)(A) of the Water Supply, Re-  
14       liability, and Environmental Improvement Act  
15       (Public Law 108–361; 118 Stat. 1684) Public  
16       Law 108–361.

17              (B) EXCEPTION.—Additional Federal  
18       amounts may be appropriated for construction  
19       of a project described in subparagraph (A) if  
20       non-Federal amounts are used to finance and  
21       construct the project.

22   **SEC. 518. BAY-DELTA ACCORD.**

23       (a) CONGRESSIONAL DIRECTION REGARDING CEN-  
24       TRAL VALLEY PROJECT AND CALIFORNIA STATE WATER  
25       PROJECT OPERATIONS.—

1           (1) IN GENERAL.—The Central Valley Project  
2           and the California State Water Project shall be op-  
3           erated strictly in accordance with the water quality  
4           standards and operational constraints described in  
5           the “Principles for Agreement on the Bay-Delta  
6           Standards Between the State of California and the  
7           Federal Government” dated December 15, 1994.

8           (2) APPLICABILITY OF OTHER LAW.—The En-  
9           dangered Species Act of 1973 (16 U.S.C. 1531 et  
10          seq.) and other applicable law shall not apply to op-  
11          erations described in paragraph (1).

12          (3) IMPLEMENTATION.—Implementation of the  
13          “Principles for Agreement on the Bay-Delta Stand-  
14          ards Between the State of California and the Fed-  
15          eral Government” dated December 15, 1994, shall  
16          be in strict compliance with the water rights priority  
17          system and statutory protections for areas of origin.

18          (b) APPLICATION OF LAWS TO OTHERS.—

19               (1) IN GENERAL.—As a condition of the receipt  
20               of Federal amounts for the Central Valley Project  
21               and the California State Water Project, the State of  
22               California (including any agency or board of the  
23               State of California), on any water right obtained  
24               pursuant to State law, including a pre-1914 appro-  
25               priative right, shall not—



1                   (A) impose any condition that restricts the  
2                   exercise of that water right that is affected by  
3                   operations of the Central Valley Project or Cali-  
4                   fornia State Water Project;

5                   (B) restrict under the Public Trust Doc-  
6                   trine any public trust value imposed in order to  
7                   conserve, enhance, recover, or otherwise protect  
8                   any species.

9                   (2) FEDERAL AGENCIES.—The prohibition  
10                  under paragraph (1)(A) shall apply to Federal agen-  
11                  cies.

12                  (c) COSTS.—No cost associated with the implementa-  
13                  tion of this section shall be imposed directly or indirectly  
14                  on any Central Valley Project contractor, or any other per-  
15                  son or entity, unless those costs are incurred on a vol-  
16                  untary basis.

17                  (d) NATIVE SPECIES PROTECTION.—This section  
18                  preempts any law of the State California law restricting  
19                  the quantity or size of a nonnative fish that is taken or  
20                  harvested that preys on 1 or more native fish species that  
21                  occupy the Sacramento and San Joaquin Rivers and the  
22                  tributaries of those rivers or the Sacramento-San Joaquin  
23                  Rivers Delta.

1   **SEC. 519. NATURAL AND ARTIFICIALLY SPAWNED SPECIES.**

2           After the date of enactment of this Act, and regard-  
3 less of the date of listing, the Secretaries of the Interior  
4 and Commerce shall not distinguish between natural-  
5 spawned and hatchery-spawned (or otherwise artificially  
6 propagated strains of a species) in making any determina-  
7 tion under the Endangered Species Act of 1973 (16  
8 U.S.C. 1531 et seq.) that relates to an anadromous fish  
9 species present in the Sacramento and San Joaquin Rivers  
10 or the tributaries of those rivers and that ascends those  
11 rivers and tributaries to reproduce after maturing in San  
12 Francisco Bay or the Pacific Ocean.

13   **SEC. 520. AUTHORIZED SERVICE AREA.**

14           (a) IN GENERAL.—The Secretary of the Interior, act-  
15 ing through the Commissioner of Reclamation, shall in-  
16 clude in the service area of the Central Valley Project au-  
17 thorized under the Central Valley Project Improvement  
18 Act (Public Law 102–575; 106 Stat. 4706) the area with-  
19 in the boundaries of the Kettleman City Community Serv-  
20 ices District, California, as those boundaries are defined  
21 as of the date of enactment of this Act.

22           (b) LONG-TERM CONTRACT.—

23               (1) IN GENERAL.—Notwithstanding the Central  
24 Valley Project Improvement Act (Public Law 102–  
25 575; 106 Stat. 4706) and subject to paragraph (2),  
26 the Secretary, in accordance with the reclamation

1 laws, shall enter into a long-term contract with the  
2 Kettleman City Community Services District or the  
3 delivery of not more than 900 acre-feet of Central  
4 Valley Project water for municipal and industrial  
5 use.

6 (2) REDUCTION IN CONTRACT.—The Secretary  
7 may temporarily reduce deliveries of the quantity of  
8 water made available under paragraph (1) by not  
9 more than 25 percent of the total whenever reduc-  
10 tions due to hydrologic circumstances are imposed  
11 on agricultural deliveries of Central Valley Project  
12 water.

13 (c) ADDITIONAL COST.—If any additional infrastruc-  
14 ture or related costs are needed to implement this section,  
15 those costs shall be the responsibility of the non-Federal  
16 entity.

17 **SEC. 521. REGULATORY STREAMLINING.**

18 (a) DEFINITIONS.—In this section:

19 (1) CVP.—The term “CVP” means the Central  
20 Valley Project.

21 (2) PROJECT.—The term “project”—

22 (A) means an activity that—

23 (i) is undertaken by a public agency,  
24 funded by a public agency, or requires the  
25 issuance of a permit by a public agency;

1 (ii) has a potential to result in a phys-  
2 ical change to the environment; and

3 (iii) may be subject to several discre-  
4 tionary approvals by governmental agen-  
5 cies;

6 (B) may include construction activities,  
7 clearing or grading of land, improvements to  
8 existing structures, and activities or equipment  
9 involving the issuance of a permit; or

10 (C) has the meaning given the term de-  
11 fined in section 21065 of the California Public  
12 Resource Code.

13 (b) APPLICABILITY OF CERTAIN LAWS.—The filing  
14 of a notice of determination or a notice of exemption for  
15 any project, including the issuance of a permit under State  
16 law, for any project of the CVP or the delivery of water  
17 from the CVP in accordance with the California Environ-  
18 mental Quality Act shall be considered to meet the re-  
19 quirements for that project or permit under section  
20 102(2)(C) of the National Environmental Protection Act  
21 of 1969 (42 U.S.C. 4332(2)(C)).

22 (c) CONTINUATION OF PROJECT.—The Bureau of  
23 Reclamation shall not be required to cease or modify any  
24 major Federal action or other activity for any project of  
25 the CVP or the delivery of water from the CVP pending

1 completion of judicial review of any determination made  
2 under the National Environmental Protection Act of 1969  
3 (42 U.S.C. 4321 et seq.).

4       **Subtitle B—San Joaquin River**  
5               **Restoration**

6       **SEC. 531. REPEAL OF THE SAN JOAQUIN RIVER SETTLE-**  
7               **MENT.**

8               As of the date of enactment of this Act, the Secretary  
9 shall cease any action to implement the Stipulation of Set-  
10 tlement, Natural Resources Defense Council, Inc. v. Rod-  
11 gers, No. Civ. S–88–1658 LKK/GGH (E.D. Cal. Sept. 13,  
12 2006).

13       **SEC. 532. PURPOSE.**

14               Section 10002 of the San Joaquin River Restoration  
15 Settlement Act (Public Law 111–11; 123 Stat. 1349) is  
16 amended by striking “implementation of the Settlement”  
17 and inserting “restoration of the San Joaquin River”.

18       **SEC. 533. DEFINITIONS.**

19               Section 10003 of the San Joaquin River Restoration  
20 Settlement Act (Public Law 111–11; 123 Stat. 1349) is  
21 amended—

22               (1) by redesignating paragraphs (2) and (3) as  
23 paragraphs (3) and (4), respectively;

24               (2) by striking paragraph (1) and inserting the  
25 following:

1           “(1) CRITICAL WATER YEAR.—The term ‘crit-  
2       ical water year’ means a year in which the total  
3       unimpaired runoff at Friant Dam is less than  
4       400,000 acre-feet, as forecasted as of March 1 of  
5       that water year by the California Department of  
6       Water Resources.

7           “(2) RESTORATION FLOWS.—The term ‘Res-  
8       toration Flows’ means the additional water released  
9       or bypassed from Friant Dam to ensure that the  
10      target flow entering Mendota Pool, located approxi-  
11      mately 62 river miles downstream from Friant Dam,  
12      does not fall below a speed of 50 cubic feet per sec-  
13      ond.”; and

14           (3) by striking paragraph (4) (as redesignated  
15      by paragraph (1)) and inserting the following:

16           “(4) WATER YEAR.—The term ‘water year’  
17      means the period beginning March 1 of a given year  
18      and ending on the last day of February of the fol-  
19      lowing calendar year.”.

20   **SEC. 534. IMPLEMENTATION OF RESTORATION.**

21       Section 10004 of the San Joaquin River Restoration  
22   Settlement Act (Public Law 111–11; 123 Stat. 1350) is  
23   amended—

24           (1) in subsection (a)—

1 (A) by striking “hereby authorized and di-  
2 rected” and all that follows through “in the  
3 Settlement:” and inserting “may carry out the  
4 following:”;

5 (B) by striking paragraphs (1), (2), (4),  
6 and (5);

7 (C) by redesignating paragraph (3) as  
8 paragraph (1);

9 (D) in paragraph (1) (as redesignated by  
10 subparagraph (C)), by striking “paragraph 13  
11 of the Settlement” and inserting “this part”;  
12 and

13 (E) by adding at the end the following :

14 “(2) In each water year, beginning in the water  
15 year commencing on March 1, 2013, the Secretary—

16 “(A) shall modify Friant Dam operations  
17 to release the Restoration Flows for that water  
18 year, unless the year is a critical water year;

19 “(B) shall ensure that—

20 “(i) the release of Restoration Flows  
21 are maintained at the level prescribed by  
22 this part; and

23 “(ii) Restoration Flows do not reach  
24 downstream of Mendota Pool;

1           “(C) shall release the Restoration Flows in  
2           a manner that improves the fishery in the San  
3           Joaquin River below Friant Dam and upstream  
4           of Gravelly Ford, Nevada, as in existence on the  
5           date of the enactment of the Sacramento and  
6           San Joaquin Valleys Water Reliability Act, in-  
7           cluding the associated riparian habitat; and

8           “(D) may, without limiting the actions re-  
9           quired under subparagraphs (A) and (C) and  
10          subject to paragraph (3) and subsection (l), use  
11          the Restoration Flows to enhance or restore a  
12          warm water fishery downstream of Gravelly  
13          Ford, Nevada, including to Mendota Pool, if the  
14          Secretary determines that the action is reason-  
15          able, prudent, and feasible.

16          “(3) Not later than 1 year after the date of en-  
17          actment of the Sacramento and San Joaquin Valleys  
18          Water Reliability Act, the Secretary shall develop  
19          and implement, in cooperation with the State of  
20          California, a reasonable plan—

21                 “(A) to fully recirculate, recapture, reuse,  
22                 exchange, or transfer all Restoration Flows;  
23                 and

24                 “(B) to provide the recirculated, recap-  
25                 tured, reused, exchanged, or transferred flows



1 to those contractors within the Friant Division,  
2 Hidden Unit, and Buchanan Unit of the Cen-  
3 tral Valley Project that relinquished the Res-  
4 toration Flows that were recirculated, recap-  
5 tured, reused, exchanged, or transferred.

6 “(4) The plan described in paragraph (3)  
7 shall—

8 “(A) address any impact on groundwater  
9 resources within the service area of the Friant  
10 Division, Hidden Unit, and Buchanan Unit of  
11 the Central Valley Project and mitigation may  
12 include groundwater banking and recharge  
13 projects;

14 “(B) not impact the water supply or water  
15 rights of any entity outside the Friant Division,  
16 Hidden Unit, and Buchanan Unit of the Cen-  
17 tral Valley Project; and

18 “(C) be subject to applicable provisions of  
19 California water law and the use by the Sec-  
20 retary of the Interior of Central Valley Project  
21 facilities to make Project water (other than  
22 water released from Friant Dam under this  
23 part) and water acquired through transfers  
24 available to existing south of Delta Central Val-  
25 ley Project contractors.”;

1 (2) in subsection (b)—

2 (A) in paragraph (1), by striking “the Set-  
3 tlement” and inserting “this part”; and

4 (B) in paragraph (2), by striking “the Set-  
5 tlement” and inserting “this part”;

6 (3) in subsection (c), by striking “the Settle-  
7 ment” and inserting “this part”;

8 (4) by striking subsection (d) and inserting the  
9 following:

10 “(d) MITIGATION OF IMPACTS.—

11 “(1) IN GENERAL.—Not later than October 1,  
12 2013 and subject to paragraph (2), the Secretary  
13 shall identify—

14 “(A) the impacts associated with the re-  
15 lease of Restoration Flows prescribed in this  
16 part; and

17 “(B) the measures to be implemented to  
18 mitigate impacts on adjacent and downstream  
19 water users, landowners, and agencies as a re-  
20 sult of Restoration Flows.

21 “(2) MITIGATION MEASURES.—Before imple-  
22 menting a decision or agreement to construct, im-  
23 prove, operate, or maintain a facility that the Sec-  
24 retary determines is necessary to implement this  
25 part, the Secretary shall implement all mitigation

- 1 measures identified in paragraph (1)(B) before the  
2 date on which Restoration Flows are commenced.”;
- 3 (5) in subsection (e), by striking “the Settle-  
4 ment” and inserting “this part”;
- 5 (6) in subsection (f), by striking “the Settle-  
6 ment and section 10011” and inserting “this part”;
- 7 (7) in subsection (g)—
- 8 (A) by striking “the Settlement and”; and
- 9 (B) by striking “or exchange contract” and  
10 inserting “exchange contract, water rights set-  
11 tlement, or holding contract”;
- 12 (8) in subsection (h)—
- 13 (A) by striking “INTERIM” in the header;
- 14 (B) in paragraph (1)—
- 15 (i) in the matter preceding subpara-  
16 graph (A), by striking “Interim Flows  
17 under the Settlement” and inserting “Res-  
18 toration Flows under this part”;
- 19 (ii) in subparagraph (C)—
- 20 (I) in clause (i), by striking “In-  
21 terim” and inserting “Restoration”;
- 22 and
- 23 (II) in clause (ii), by inserting  
24 “and” after the semicolon;

1 (iii) in subparagraph (D), by striking

2 “and” at the end; and

3 (iv) by striking subparagraph (E);

4 (C) by striking paragraph (2) and insert-  
5 ing the following:

6 “(2) CONDITIONS FOR RELEASE.—The Sec-  
7 retary may release Restoration Flows to the extent  
8 that the flows would not exceed existing downstream  
9 channel capacities.”;

10 (D) in paragraph (3), by striking “In-  
11 terim” and inserting “Restoration”; and

12 (E) by striking paragraph (4) and insert-  
13 ing the following:

14 “(4) CLAIMS.—Not later than 60 days after the  
15 date of enactment of the Sacramento and San Joa-  
16 quin Valleys Water Reliability Act, the Secretary  
17 shall issue, by regulation, a claims process to ad-  
18 dress claims, including groundwater seepage, flood-  
19 ing, or levee instability damages caused as a result  
20 of, arising out of, or related to implementation of  
21 this subtitle.”;

22 (9) in subsection (i)—

23 (A) in paragraph (1)—

1 (i) in the matter preceding subpara-  
2 graph (A), by striking “the Settlement and  
3 parts I and III” and inserting “this part”;

4 (ii) in subparagraph (A), by inserting  
5 “and” after the semicolon;

6 (iii) in subparagraph (B)—

7 (I) by striking “additional  
8 amounts authorized to be appro-  
9 priated, including the”; and

10 (II) by striking “; and” and in-  
11 serting a period; and

12 (iv) by striking subparagraph (C); and  
13 (B) by striking paragraph (3); and

14 (10) by adding at the end the following:

15 “(k) NO IMPACTS ON OTHER INTERESTS.—

16 “(1) IN GENERAL.—No Central Valley Project  
17 or other water (other than San Joaquin River water  
18 impounded by or bypassed from Friant Dam) shall  
19 be used to implement subsection (a)(2) unless the  
20 use is on a voluntary basis.

21 “(2) INVOLUNTARY COSTS.—No cost associated  
22 with the implementation of this section shall be im-  
23 posed directly or indirectly on any Central Valley  
24 Project contractor, or any other person or entity,  
25 outside the Friant Division, the Hidden Unit, or the

1 Buchanan Unit, unless the cost is incurred on a vol-  
2 untary basis.

3 “(3) REDUCTION IN WATER SUPPLIES.—The  
4 implementation of this part shall not directly or indi-  
5 rectly reduce any water supply or water reliability on  
6 any Central Valley Project contractor, any State  
7 Water Project contractor, or any other person or en-  
8 tity, outside the Friant Division, the Hidden Unit,  
9 or the Buchanan Unit, unless the reduction or cost  
10 is incurred on a voluntary basis.

11 “(1) PRIORITY.—Each action taken under this part  
12 shall be subordinate to the use by the Secretary of Central  
13 Valley Project facilities to make Project water available  
14 to Project contractors, other than water released from the  
15 Friant Dam under this part.

16 “(m) APPLICABILITY.—

17 “(1) IN GENERAL.—Notwithstanding section 8  
18 of the Act of June 17, 1902 (32 Stat. 390, chapter  
19 1093), except as provided in this part and subtitle  
20 D of the Sacramento and San Joaquin Valleys  
21 Water Reliability Act, this part—

22 “(A) preempts and supersedes any State  
23 law, regulation, or requirement that imposes  
24 more restrictive requirements or regulations on  
25 the activities authorized under this part; and

1           “(B) does not alter or modify any obliga-  
2           tion of the Friant Division, Hidden Unit, and  
3           Buchanan Unit of the Central Valley Project,  
4           or other water users on the San Joaquin River,  
5           or tributaries of the San Joaquin River, under  
6           any order issued by the State Water Resources  
7           Control Board under the Porter-Cologne Water  
8           Quality Control Act (California Water Code sec-  
9           tion 13000 et seq.).

10          “(2) APPLICABILITY.—An order described in  
11          paragraph (1)(B) shall be consistent with any con-  
12          gressional authorization for any affected Federal fa-  
13          cility relating to the Central Valley Project.

14          “(n) PROJECT IMPLEMENTATION.—Any project to  
15          implement this part shall be phased such that each project  
16          shall include—

17               “(1) the project purpose and need;

18               “(2) identification of mitigation measures;

19               “(3) appropriate environmental review; and

20               “(4) prior to releasing Restoration Flows under  
21          this part the completion of the any required mitiga-  
22          tion measures and the completion of the project.”.

1 **SEC. 535. DISPOSAL OF PROPERTY; TITLE TO FACILITIES.**

2 Section 10005 of the San Joaquin River Restoration  
3 Settlement Act (Public Law 111–11; 123 Stat. 1353) is  
4 amended—

5 (1) in subsection (a), by striking “the Settle-  
6 ment authorized by this part” and inserting “this  
7 part”;

8 (2) in subsection (b)—

9 (A) in paragraph (1)—

10 (i) by striking “(1) IN GENERAL.—  
11 The Secretary” and inserting “The Sec-  
12 retary”; and

13 (ii) by striking “the Settlement au-  
14 thorized by this part” and inserting “this  
15 part”; and

16 (B) by striking paragraph (2); and

17 (3) in subsection (c)—

18 (A) in paragraph (1), by striking “the Set-  
19 tlement” and inserting “this part”;

20 (B) in paragraph (2)—

21 (i) by striking “through the exercise  
22 of its eminent domain authority”; and

23 (ii) by striking “the Settlement” and  
24 inserting “this part”; and

25 (C) in paragraph (3), by striking “section  
26 10009(c)” and inserting “section 10009”.



1 **SEC. 536. COMPLIANCE WITH APPLICABLE LAW.**

2 Section 10006 of the San Joaquin River Restoration  
3 Settlement Act (Public Law 111–11; 123 Stat. 1354) is  
4 amended—

5 (1) in subsection (a)—

6 (A) in paragraph (1), by inserting “, un-  
7 less otherwise provided by this part” before the  
8 period at the end; and

9 (B) in paragraph (2), by striking “the Set-  
10 tlement” and inserting “this part”;

11 (2) in subsection (b), by inserting “, unless oth-  
12 erwise provided by this part” before the period at  
13 the end;

14 (3) in subsection (c)—

15 (A) in paragraph (2), by striking “section  
16 10004” and inserting “this part”; and

17 (B) in paragraph (3), by striking “the Set-  
18 tlement” and inserting “this part”; and

19 (4) in subsection (d)—

20 (A) by inserting “, including, without limi-  
21 tation, the costs of implementing subsections  
22 (d) and (h)(4) of section 10004,” after “imple-  
23 menting this part”; and

24 (B) by striking “for implementation of the  
25 Settlement,”.

1   **SEC. 537. COMPLIANCE WITH CENTRAL VALLEY PROJECT**  
2                   **IMPROVEMENT ACT.**

3           Section 10007 of the San Joaquin River Restoration  
4 Settlement Act (Public Law 111–11; 123 Stat. 1354) is  
5 amended—

6           (1) in the matter preceding paragraph (1)—

7                   (A) by striking “the Settlement” and in-  
8 serting “the enactment of this part”; and

9                   (B) by inserting: “and the obligations of  
10 the Secretary and all other parties to protect  
11 and keep in good condition any fish that may  
12 be planted or exist below Friant Dam, including  
13 any obligations under section 5937 of the Cali-  
14 fornia Fish and Game Code and the public  
15 trust doctrine, and those of the Secretary and  
16 all other parties under the Endangered Species  
17 Act of 1973 (16 U.S.C. 1531 et seq.)” before  
18 “, provided”; and

19           (2) in paragraph (1), by striking “, as provided  
20 in the Settlement”.

21   **SEC. 538. NO PRIVATE RIGHT OF ACTION.**

22           Section 10008(a) of the San Joaquin River Restora-  
23 tion Settlement Act (Public Law 111–11; 123 Stat. 1355)  
24 is amended—

25           (1) by striking “not a party to the Settlement”;  
26 and

1           (2) by striking “or the Settlement” and insert-  
2           ing “unless otherwise provided by this part, but any  
3           Central Valley Project long-term water service or re-  
4           payment contractor within the Friant Division, Hid-  
5           den unit, or Buchanan unit adversely affected by the  
6           failure of the Secretary to comply with section  
7           10004(a)(3) may bring an action against the Sec-  
8           retary for injunctive relief, damages, or both.”.

9   **SEC. 539. IMPLEMENTATION.**

10          Section 10009 of the San Joaquin River Restoration  
11   Settlement Act (Public Law 111–11; 123 Stat. 1355) is  
12   amended—

13           (1) in the section heading, by striking “; **SET-**  
14   **TLEMENT FUND**”;

15           (2) in subsection (a)—

16                (A) in paragraph (1)—

17                   (i) by striking “the Settlement” the  
18                   first place it appears and inserting “this  
19                   part”;

20                   (ii) by striking “, estimated to total”  
21                   and all that follows through “subsection  
22                   (b)(1),”; and

23                   (iii) by striking “; provided however,”  
24                   and all that follows through  
25                   “\$110,000,000 of State funds”;

1 (B) in paragraph (2)—

2 (i) in subparagraph (A), by striking  
3 “(A) IN GENERAL.—The Secretary” and  
4 inserting “The Secretary”; and

5 (ii) by striking subparagraph (B); and  
6 (C) in paragraph (3)—

7 (i) by striking “Except as provided in  
8 the Settlement, to” and inserting “To”;  
9 and

10 (ii) by striking “this Settlement” and  
11 inserting “this part”;

12 (3) in subsection (b)(1)—

13 (A) by striking “In addition” and all that  
14 follows through “however, that the” and insert-  
15 ing “The”;

16 (B) by striking “such additional appropria-  
17 tions only in amounts equal to”; and

18 (C) by striking “or the Settlement”;

19 (4) in subsection (c)—

20 (A) in paragraph (1)—

21 (i) in the matter preceding subpara-  
22 graph (A), by striking “the Settlement”  
23 and inserting “this part”;

1 (ii) in subparagraph (C), by striking  
2 “from the sale of water pursuant to the  
3 Settlement, or”; and

4 (iii) in subparagraph (D), by striking  
5 “the Settlement” and inserting “this  
6 part”;

7 (B) in paragraph (2), by striking “the Set-  
8 tlement and”; and  
9 (5) by striking subsections (d) through (f).

10 **SEC. 540. REPAYMENT CONTRACTS AND ACCELERATION OF**  
11 **REPAYMENT OF CONSTRUCTION COSTS.**

12 Section 10010 of the San Joaquin River Restoration  
13 Settlement Act (Public Law 111–11; 123 Stat. 1358) is  
14 amended—

15 (1) in paragraphs (3)(D) and (4)(C) of sub-  
16 section (a), by striking “the Settlement and” each  
17 place it appears;

18 (2) in subsection (c), by striking paragraph (3);

19 (3) in subsection (d)(1), by striking “the Settle-  
20 ment” each place it appears and inserting “this  
21 part”;

22 (4) in subsection (e)—

23 (A) in paragraph (1)—

24 (i) by striking “Interim Flows or Res-  
25 toration Flows, pursuant to paragraphs 13

1 or 15 of the Settlement” and inserting  
2 “Restoration Flows, pursuant to this  
3 part”;

4 (ii) by striking “Interim Flows or” be-  
5 fore “Restoration Flows”; and

6 (iii) by striking “the Interim Flows or  
7 Restoration Flows or is intended to other-  
8 wise facilitate the Water Management  
9 Goal, as described in the Settlement” and  
10 inserting “Restoration Flows”; and

11 (B) in paragraph (2)—

12 (i) by striking “except as provided in  
13 paragraph 16(b) of the Settlement”; and

14 (ii) by striking “the Interim Flows or  
15 Restoration Flows or to facilitate the  
16 Water Management Goal” and inserting  
17 “Restoration Flows”.

18 **SEC. 541. REPEAL.**

19 Section 10011 of the San Joaquin River Restoration  
20 Settlement Act (Public Law 111–11; 123 Stat. 1362) is  
21 repealed.

22 **SEC. 542. WATER SUPPLY MITIGATION.**

23 Section 10202(b) of the San Joaquin River Restora-  
24 tion Settlement Act (Public Law 111–11; 123 Stat. 1365)  
25 is amended—

1           (1) in paragraph (1), by striking “the Interim  
2           or Restoration Flows authorized in part I of this  
3           subtitle” and inserting “Restoration Flows author-  
4           ized in this part”;

5           (2) in paragraph (2), by striking “the Interim  
6           or Restoration Flows authorized in part I of this  
7           subtitle” and inserting “Restoration Flows author-  
8           ized in this part”; and

9           (3) in paragraph (3)—

10           (A) in subparagraph (A), by striking  
11           “meet the Restoration Goal as described in part  
12           I of this subtitle” and inserting “recover Res-  
13           toration Flows as described in this part”;

14           (B) in subparagraph (C)—

15           (i) by striking “the Interim or Res-  
16           toration Flows authorized in part I of this  
17           subtitle” and inserting “Restoration Flows  
18           authorized in this part”; and

19           (ii) by striking “, and for ensuring ap-  
20           propriate adjustment in the recovered  
21           water account pursuant to section  
22           10004(a)(5)”.

1 **SEC. 543. ADDITIONAL AUTHORITIES.**

2 Section 10203 of the San Joaquin River Restoration  
3 Settlement Act (Public Law 111–11; 123 Stat. 1367) is  
4 amended—

5 (1) in subsection (b)—

6 (A) by striking “section 10004(a)(4)” and  
7 inserting “section 10004(a)(3)”; and

8 (B) by striking “, provided” and all that  
9 follows through “section 10009(f)(2)”; and

10 (2) by striking subsection (c).

11 **Subtitle C—Repayment Contracts**  
12 **and Acceleration of Repayment**  
13 **of Construction Costs**

14 **SEC. 551. REPAYMENT CONTRACTS AND ACCELERATION OF**  
15 **REPAYMENT OF CONSTRUCTION COSTS.**

16 (a) **CONVERSION OF CONTRACTS.—**

17 (1) **CERTAIN CONTRACTS.—**

18 (A) **IN GENERAL.—**Not later than 1 year  
19 after the date enactment of this Act, the Sec-  
20 retary of the Interior, on the request of a con-  
21 tractor, shall convert all existing long-term Cen-  
22 tral Valley Project contracts entered into under  
23 section 9(e) of the Act of August 4, 1939 (53  
24 Stat. 1196, chapter 418), to a contract under  
25 section 9(d) of that Act (53 Stat. 1195), under  
26 mutually agreeable terms and conditions.



1 (B) RESTRICTIONS.—A contract converted  
2 under subparagraph (A) shall—

3 (i) require the repayment, either in  
4 lump sum or by accelerated prepayment, of  
5 the remaining amount of construction costs  
6 identified in the most current version of  
7 the Central Valley Project Schedule of Irrigation  
8 Capital Allocations by Contractor,  
9 as adjusted to reflect payments not reflected  
10 in that schedule and properly assignable  
11 for ultimate return by the contractor,  
12 not later than January 31, 2013  
13 (or if made in approximately equal annual  
14 installments, not later than January 31,  
15 2016), which amount shall be discounted  
16 by the Treasury rate (defined as the 20-  
17 year Constant Maturity Treasury rate published  
18 by the Department of the Treasury  
19 as of October 1, 2012);

20 (ii) require that, notwithstanding sub-  
21 section (c)(2), construction costs or other  
22 capitalized costs incurred after the effective  
23 date of the converted contract or not  
24 reflected in the schedule described in

1 clause (i) and properly assignable to that  
2 contractor, shall be repaid—

3 (I) in not more than 5 years  
4 after the date on which the contractor  
5 is notified of the allocation if that  
6 amount is a result of a collective an-  
7 nual allocation of capital costs to the  
8 contractors exercising contract conver-  
9 sions under this subsection of less  
10 than \$5,000,000; or

11 (II) if the allocation of capital  
12 costs described in subclause (I) equal  
13 \$5,000,000 or more, as provided by  
14 applicable reclamation law, subject to  
15 the condition that the reference to the  
16 amount of \$5,000,000 shall not be a  
17 precedent in any other context; and

18 (iii) provide that power revenues will  
19 not be available to aid in the repayment of  
20 construction costs allocated to irrigation  
21 under the contract.

22 (C) ESTIMATE.—Not later than 180 days  
23 after the date of enactment of this Act, the Sec-  
24 retary of the Interior shall provide to each con-  
25 tractor an estimate of the remaining amount of

1 construction costs under subparagraph (B)(i) as  
2 of January 31, 2013, as adjusted.

3 (2) OTHER CONTRACTS.—

4 (A) IN GENERAL.—Not later than 1 year  
5 after the date of enactment of this Act, on the  
6 request of a contractor, the Secretary may con-  
7 vert any Central Valley Project long-term con-  
8 tract entered into under section 9(c)(2) of the  
9 Act of August 4, 1939 (chapter 418; 53 Stat.  
10 1194) to a contract under section 9(c)(1) of  
11 that Act, under mutually agreeable terms and  
12 conditions.

13 (B) RESTRICTIONS.—A contract converted  
14 under subparagraph (A) shall—

15 (i) require the repayment in lump sum  
16 of the remaining amount of construction  
17 costs identified in the most current version  
18 of the Central Valley Project Schedule of  
19 Municipal and Industrial Water Rates, as  
20 adjusted to reflect payments not reflected  
21 in that schedule and properly assignable  
22 for ultimate return by the contractor, not  
23 later than January 31, 2016; and

24 (ii) require that, notwithstanding sub-  
25 section (c)(2), construction costs or other

1 capitalized costs incurred after the effec-  
2 tive date of the contract or not reflected in  
3 the Schedule described in clause (i), and  
4 properly assignable to that contractor,  
5 shall be repaid—

6 (I) in not more than 5 years  
7 after the date on which the contractor  
8 is notified of the allocation if the  
9 amount is a result of a collective an-  
10 nual allocation of capital costs to the  
11 contractors exercising contract conver-  
12 sions under this subsection of less  
13 than \$5,000,000; or

14 (II) if the allocation of capital  
15 costs described in subclause (I) equal  
16 \$5,000,000 or more, as provided by  
17 applicable reclamation law, subject to  
18 the condition that the reference to the  
19 amount of \$5,000,000 shall not be a  
20 precedent in any other context.

21 (C) ESTIMATE.—Not later than 180 days  
22 after the date of enactment of this Act, the Sec-  
23 retary of the Interior shall provide to each con-  
24 tractor an estimate of the remaining amount of

1 construction costs under subparagraph (B)(i) as  
2 of January 31, 2016, as adjusted.

3 (b) FINAL ADJUSTMENT.—

4 (1) IN GENERAL.—The amounts paid pursuant  
5 to subsection (a) shall be subject to adjustment fol-  
6 lowing a final cost allocation by the Secretary of the  
7 Interior on completion of the construction of the  
8 Central Valley Project.

9 (2) REPAYMENT OBLIGATION.—

10 (A) IN GENERAL.—If the final cost alloca-  
11 tion indicates that the costs properly assignable  
12 to the contractor are greater than the amount  
13 that has been paid by the contractor, the con-  
14 tractor shall pay the remaining allocated costs.

15 (B) TERMS.—The term of an additional  
16 repayment contract described in subparagraph  
17 (A) shall be—

18 (i) for not less than 1 year and not  
19 more than 10 years; and

20 (ii) based on mutually agreeable provi-  
21 sions regarding the rate of repayment of  
22 the amount developed by the parties.

23 (3) CREDITS.—If the final cost allocation indi-  
24 cates that the costs properly assignable to the con-  
25 tractor are less than the amount that the contractor

1       has paid, the Secretary of the Interior shall credit  
2       the amount of the overpayment as an offset against  
3       any outstanding or future obligation of the con-  
4       tractor.

5       (c) APPLICABILITY OF CERTAIN PROVISIONS.—

6           (1) IN GENERAL.—Notwithstanding any repay-  
7       ment obligation under subsection (a)(1)(B)(ii) or  
8       subsection (b), on the compliance of a contractor  
9       with and discharge of the obligation of repayment of  
10      the construction costs under that subsection, the  
11      ownership and full-cost pricing limitations of any  
12      provision of the reclamation laws shall not apply to  
13      land in that district.

14          (2) OTHER CONTRACTS.—Notwithstanding any  
15      repayment obligation under paragraph (1)(B)(ii) or  
16      (2)(B)(ii) of subsection (a) or subsection (b), on the  
17      compliance of a contractor with and discharge of the  
18      obligation of repayment of the construction costs  
19      under that subsection, the contractor shall continue  
20      to pay applicable operation and maintenance costs  
21      and other charges applicable to the repayment con-  
22      tracts pursuant to then-current rate-setting policy  
23      and applicable law.

24      (d) CERTAIN REPAYMENT OBLIGATIONS NOT AL-  
25      TERED.—This section does not—

(1) alter the repayment obligation of any other long-term water service or repayment contractor receiving water from the Central Valley Project; or

(2) shift any costs that would otherwise have been properly assignable to a contractor absent this section, including operations and maintenance costs, construction costs, or other capitalized costs incurred after the date of enactment of this Act, to other contractors.

(e) STATUTORY INTERPRETATION.—Nothing in this subtitle affects the right of any long-term contractor to use a particular type of financing to make the payments required in paragraph (1)(B)(i) or (2)(B)(i) of subsection (a).

15 **Subtitle D—Bay-Delta Watershed**  
16 **Water Rights Preservation and**  
17 **Protection**

1 (A) strictly adhere to State water rights  
2 law governing water rights priorities by hon-  
3 oring water rights senior to those belonging to  
4 the Central Valley Project, regardless of the  
5 source of priority; and

6 (B) strictly adhere to and honor water  
7 rights and other priorities that are obtained or  
8 exist pursuant to the California Water Code, in-  
9 cluding sections 10505, 10505:5, 11128,  
10 11460, 11463, and 12220; and

11 (2) any action that affects the diversion of  
12 water or involves the release of water from any Cen-  
13 tral Valley Project water storage facility taken by  
14 the Secretary of the Interior or the Secretary of  
15 Commerce to conserve, enhance, recover, or other-  
16 wise protect any species listed under the Endangered  
17 Species Act of 1973 (16 U.S.C. 1531 et seq.) shall  
18 be applied in a manner that is consistent with water  
19 right priorities established by State law.

20 **SEC. 562. SACRAMENTO RIVER SETTLEMENT CONTRACTS.**

21 (a) IN GENERAL.—In carrying out the Endangered  
22 Species Act of 1973 (16 U.S.C. 1531 et seq.) in the Bay-  
23 Delta and on the Sacramento River, the Secretary of the  
24 Interior and the Secretary of Commerce shall apply any  
25 limitations on the operation of the Central Valley Project



1 or relating to the formulation of any reasonable prudent  
2 alternative associated with the operation of the Central  
3 Valley Project in a manner that strictly adheres to and  
4 applies the water rights priorities for project water and  
5 base supply as provided in the Sacramento River Settle-  
6 ment Contracts.

7 (b) APPLICABILITY.—Article 3(i) of the Sacramento  
8 River Settlement Contracts shall not be used by the Sec-  
9 retary of the Interior or any other Federal agency head  
10 as means to provide shortages that are different from  
11 those provided for in Article 5(a) of the Sacramento River  
12 Settlement Contracts.

13 **SEC. 563. SACRAMENTO RIVER WATERSHED WATER SERV-**  
14 **ICE CONTRACTORS.**

15 (a) EXISTING CENTRAL VALLEY PROJECT AGRICUL-  
16 TURAL WATER SERVICE CONTRACTORS WITHIN SAC-  
17 RAMENTO RIVER WATERSHED.—In this section, the term  
18 “existing Central Valley Project agricultural water service  
19 contractors within the Sacramento River Watershed”  
20 means water service contractors within the Shasta, Trin-  
21 ity, and Sacramento River Divisions of the Central Valley  
22 Project that have a water service contract in effect on the  
23 date of enactment of this Act that provides water for irri-  
24 gation.

1 (b) ALLOCATION OF WATER.—Subject to subsection  
2 (c) and the absolute priority of the Sacramento River Set-  
3 tlement Contractors to Sacramento River supplies over  
4 Central Valley Project diversions and deliveries to other  
5 contractors, the Secretary of the Interior shall, in the op-  
6 eration of the Central Valley Project, allocate water pro-  
7 vided for irrigation purposes to existing Central Valley  
8 Project agricultural water service contractors within the  
9 Sacramento River Watershed as follows:

10 (1) Not less than 100 percent of the contract  
11 quantities in a “Wet” year (as that term is defined  
12 in the Sacramento Valley Water Year Type (40–30–  
13 30) Index).

14 (2) Not less than 100 percent of the contract  
15 quantities in an “Above Normal” year (as that term  
16 is defined in the Sacramento Valley Water Year  
17 Type (40–30–30) Index).

18 (3) Not less than 100 percent of the contract  
19 quantities in a “Below Normal” year (as that term  
20 is defined in the Sacramento Valley Water Year  
21 Type (40–30–30) Index).

22 (4) Not less than 75 percent of the contract  
23 quantities in a “Dry” year (as that term is defined  
24 in the Sacramento Valley Water Year Type (40–30–  
25 30) Index).

1           (5) Not less than 50 percent of the contract  
2           quantities in a “Critically Dry” year (as that term  
3           is defined in the Sacramento Valley Water Year  
4           Type (40–30–30) Index).

5           (c) PROTECTION OF MUNICIPAL AND INDUSTRIAL  
6           SUPPLIES.—

7           (1) IN GENERAL.—Nothing in this section—

8                   (A) modifies any provision of a water serv-  
9                   ice contract that addresses municipal and in-  
10                  dustrial water shortage policies of the Secretary  
11                  of the Interior;

12                   (B) affects or limits the authority of the  
13                  Secretary of the Interior—

14                           (i) to adopt or modify municipal and  
15                           industrial water shortage policies; or

16                           (ii) to implement municipal and indus-  
17                           trial water shortage policies; or

18                   (C) affects allocations to Central Valley  
19                  Project municipal and industrial contractors  
20                  pursuant to the water shortage policies of the  
21                  Secretary of the Interior.

22           (2) APPLICABILITY.—This section does not con-  
23           strain, govern, or affect, directly or indirectly, the  
24           operations of the American River Division of the  
25           Central Valley Project or any deliveries from that

1 Division, including the units and facilities of that  
2 Division.

3 **SEC. 564. NO REDIRECTED ADVERSE IMPACTS.**

4 The Secretary of the Interior shall ensure that there  
5 are no redirected adverse water supply or fiscal impacts  
6 to the State Water Project or to individuals within the  
7 Sacramento River or San Joaquin River watershed arising  
8 from the operation of the Secretary of the Central Valley  
9 Project to meet legal obligations imposed by or through  
10 any Federal or State agency, including—

11 (1) the Endangered Species Act of 1973 (16  
12 U.S.C. 1531 et seq.);

13 (2) this title; and

14 (3) actions or activities implemented to meet  
15 the twin goals of improving water supply and ad-  
16 dressing the environmental needs of the Bay-Delta.

17 **Subtitle E—Miscellaneous**

18 **SEC. 571. PRECEDENT.**

19 Congress finds that—

20 (1) coordinated operations between the Central  
21 Valley Project and the State Water Project, as con-  
22 sented to and requested by the State of California  
23 and the Federal Government, require the assertion  
24 of Federal supremacy to protect existing water

1 rights throughout the system, a circumstance that is  
2 unique to the State of California; and

3 (2) this title should not serve as precedent for  
4 similar operations in any other State.

5 **TITLE VI—REDUCING**  
6 **REGULATORY BURDENS**

7 **SEC. 601. SHORT TITLE.**

8 This title may be cited as the “Reducing Regulatory  
9 Burdens Act of 2012”.

10 **SEC. 602. USE OF AUTHORIZED PESTICIDES.**

11 Section 3(f) of the Federal Insecticide, Fungicide,  
12 and Rodenticide Act (7 U.S.C. 136a(f)) is amended by  
13 adding at the end the following:

14 “(5) USE OF AUTHORIZED PESTICIDES.—Ex-  
15 cept as provided in section 402(s) of the Federal  
16 Water Pollution Control Act (33 U.S.C. 1342(s)),  
17 the Administrator or a State may not require a per-  
18 mit under that Act for a discharge from a point  
19 source into navigable waters of a pesticide author-  
20 ized for sale, distribution, or use under this Act, or  
21 the residue of the pesticide, resulting from the appli-  
22 cation of the pesticide.”.

1   **SEC. 603. DISCHARGES OF PESTICIDES.**

2       Section 402 of the Federal Water Pollution Control  
3   Act (33 U.S.C. 1342) is amended by adding at the end  
4   the following:

5       “(s) DISCHARGES OF PESTICIDES.—

6           “(1) NO PERMIT REQUIREMENT.—Except as  
7       provided in paragraph (2), a permit shall not be re-  
8       quired by the Administrator or a State under this  
9       Act for a discharge from a point source into navi-  
10      gable waters of a pesticide authorized for sale, dis-  
11      tribution, or use under the Federal Insecticide, Fun-  
12      gicide, and Rodenticide Act (7 U.S.C. 136 et seq.),  
13      or the residue of the pesticide, resulting from the ap-  
14      plication of the pesticide.

15          “(2) EXCEPTIONS.—Paragraph (1) shall not  
16      apply to the following discharges of a pesticide or  
17      pesticide residue:

18           “(A) A discharge resulting from the appli-  
19      cation of a pesticide in violation of a provision  
20      of the Federal Insecticide, Fungicide, and  
21      Rodenticide Act (7 U.S.C. 136 et seq.) that is  
22      relevant to protecting water quality, if—

23           “(i) the discharge would not have oc-  
24      curred but for the violation; or

25           “(ii) the quantity of a pesticide or  
26      pesticide residue in the discharge is greater

1 than would have occurred without the vio-  
2 lation.

3 “(B) Stormwater discharges subject to reg-  
4 ulation under subsection (p).

5 “(C) The following discharges subject to  
6 regulation under this section:

7 “(i) Manufacturing or industrial efflu-  
8 ent.

9 “(ii) Treatment works effluent.

10 “(iii) Discharges incidental to the nor-  
11 mal operation of a vessel, including a dis-  
12 charge resulting from ballasting operations  
13 or vessel biofouling prevention.”.

## 14 **TITLE VII—FARM DUST** 15 **REGULATION PREVENTION**

### 16 **SEC. 701. SHORT TITLE.**

17 This title may be cited as the “Farm Dust Regulation  
18 Prevention Act of 2012”.

### 19 **SEC. 702. TEMPORARY PROHIBITION AGAINST REVISING** 20 **ANY NATIONAL AMBIENT AIR QUALITY** 21 **STANDARD APPLICABLE TO COARSE PARTIC-** 22 **ULATE MATTER.**

23 Before the date that is 1 year after the date of enact-  
24 ment of this Act, the Administrator of the Environmental  
25 Protection Agency (referred to in this title as the “Admin-

1   istrator”) may not propose, finalize, implement, or enforce  
2   any regulation revising the national primary ambient air  
3   quality standard or the national secondary ambient air  
4   quality standard applicable to particulate matter with an  
5   aerodynamic diameter greater than 2.5 micrometers under  
6   section 109 of the Clean Air Act (42 U.S.C. 7409).

7   **SEC. 703. NUISANCE DUST.**

8           Part A of title I of the Clean Air Act (42 U.S.C. 7401  
9   et seq.) is amended by adding at the end the following:  
10   **“SEC. 132. REGULATION OF NUISANCE DUST PRIMARILY BY**  
11                   **STATE, TRIBAL, AND LOCAL GOVERNMENTS.**

12           “(a) DEFINITION OF NUISANCE DUST.—In this sec-  
13   tion:

14                   “(1) IN GENERAL.—The term ‘nuisance dust’  
15   means particulate matter that—

16                           “(A) is generated primarily from natural  
17                   sources, unpaved roads, agricultural activities,  
18                   earth moving, or other activities typically con-  
19                   ducted in rural areas;

20                           “(B) consists primarily of soil, other nat-  
21                   ural or biological materials, or some combina-  
22                   tion of those materials;

23                           “(C) is not emitted directly into the ambi-  
24                   ent air from combustion, such as exhaust from



1 combustion engines and emissions from sta-  
2 tionary combustion processes; and

3 “(D) is not comprised of residuals from  
4 the combustion of coal.

5 “(2) EXCLUSION.—The term ‘nuisance dust’  
6 does not include radioactive particulate matter pro-  
7 duced from uranium mining or processing.

8 “(b) APPLICABILITY.—Except as provided in sub-  
9 section (c), this Act does not apply to, and references in  
10 this Act to particulate matter are deemed to exclude, nui-  
11 sance dust.

12 “(c) EXCEPTION.—Subsection (a) does not apply  
13 with respect to any geographical area in which nuisance  
14 dust is not regulated under State, tribal, or local law inso-  
15 far as the Administrator, in consultation with the Sec-  
16 retary of Agriculture, finds that—

17 “(1) nuisance dust (or any subcategory of nui-  
18 sance dust) causes substantial adverse public health  
19 and welfare effects at ambient concentrations; and

20 “(2) the benefits of applying standards and  
21 other requirements of this Act to nuisance dust (or  
22 a subcategory of nuisance dust) outweigh the costs  
23 (including local and regional economic and employ-  
24 ment impacts) of applying those standards and other  
25 requirements to nuisance dust (or a subcategory).”.

1 **SEC. 704. SENSE OF CONGRESS.**

2 It is the sense of Congress that the Administrator  
3 should implement an approach to excluding so-called “ex-  
4 ceptional events”, or events that are not reasonably con-  
5 trollable or preventable, from determinations of whether  
6 an area is in compliance with any national ambient air  
7 quality standard applicable to coarse particulate matter  
8 that—

9 (1) maximizes transparency and predictability  
10 for States, Indian tribes, and local governments; and

11 (2) minimizes the regulatory and cost burdens  
12 States, Indian tribes, and local governments bear in  
13 excluding those events.

14 **SEC. 705. IMPACTS OF EPA REGULATORY ACTIVITY ON EM-**  
15 **PLOYMENT AND ECONOMIC ACTIVITY IN AG-**  
16 **RICULTURE COMMUNITY.**

17 (a) DEFINITIONS.—In this section:

18 (1) COVERED ACTION.—The term “covered ac-  
19 tion” means any of the following actions taken by  
20 the Administrator under the Clean Air Act (42  
21 U.S.C. 7401 et seq.) relating to agriculture and the  
22 national primary ambient air quality standard or the  
23 national secondary ambient air quality standard for  
24 particulate matter:

1 (A) Promulgating or issuing a regulation,  
2 policy statement, guidance, response to a peti-  
3 tion, or other requirement.

4 (B) Implementing a new or substantially  
5 altered program.

6 (2) MORE THAN A DE MINIMIS NEGATIVE IM-  
7 PACT.—The term “more than a de minimis negative  
8 impact” means—

9 (A) with respect to employment levels, a  
10 loss of more than 100 jobs relating to the agri-  
11 culture industry, as calculated by excluding con-  
12 sideration of any offsetting job gains that result  
13 from the hypothetical creation of new jobs  
14 through new technologies or government em-  
15 ployment; and

16 (B) with respect to economic activity, a de-  
17 crease in agricultural economic activity of more  
18 than \$1,000,000 over any calendar year, as cal-  
19 culated by excluding consideration of any offset-  
20 ting economic activity that results from the hy-  
21 pothetical creation of new economic activity  
22 through new technologies or government em-  
23 ployment.

1 (b) ANALYSIS OF IMPACTS OF ACTIONS ON EMPLOY-  
2 MENT AND ECONOMIC ACTIVITY IN THE AGRICULTURE  
3 COMMUNITY.—

4 (1) ANALYSIS.—Before taking a covered action,  
5 the Administrator shall analyze the impact,  
6 disaggregated by State, of the covered action on—

7 (A) employment levels in the agriculture  
8 industry; and

9 (B) agricultural economic activity, includ-  
10 ing estimated job losses and decreased economic  
11 activity relating to agriculture.

12 (2) ECONOMIC MODELS.—

13 (A) IN GENERAL.—In carrying out para-  
14 graph (1), the Administrator shall use the best  
15 available economic models.

16 (B) ANNUAL GAO REPORT.—Not later  
17 than December 31 of each year, the Comp-  
18 troller General of the United States shall sub-  
19 mit to Congress a report on the economic mod-  
20 els used by the Administrator to carry out this  
21 subsection.

22 (3) AVAILABILITY OF INFORMATION.—With re-  
23 spect to any covered action, the Administrator  
24 shall—

1 (A) post the analysis under paragraph (1)  
2 as a link on the main page of the public Inter-  
3 net website of the Environmental Protection  
4 Agency;

5 (B) request the Secretary of Agriculture to  
6 post the analysis under paragraph (1) as a link  
7 on the main page of the public Internet website  
8 of the Department of Agriculture; and

9 (C) request that the Governor of any State  
10 experiencing more than a de minimis negative  
11 impact post the analysis on the main page of  
12 the public Interest website of the State.

13 (c) PUBLIC HEARINGS.—

14 (1) IN GENERAL.—If the Administrator con-  
15 cludes under subsection (a)(1) that a covered action  
16 will have more than a de minimis negative impact on  
17 agricultural employment levels or agricultural eco-  
18 nomic activity in a State, the Administrator shall  
19 hold a public hearing in each such State at least 30  
20 days before the effective date of the covered action.

21 (2) TIME, LOCATION, AND SELECTION.—A pub-  
22 lic hearing required under paragraph (1) shall be  
23 held at—

24 (A) a convenient time and location for im-  
25 pacted residents; and

1 (B) at such location selected by the Ad-  
2 ministrator as shall give priority to locations in  
3 the State that will experience the greatest num-  
4 ber of job losses.

5 (d) NOTIFICATION.—If the Administrator concludes  
6 under subsection (b)(1) that a covered action will have  
7 more than a de minimis negative impact on agricultural  
8 employment levels or agricultural economic activity in any  
9 State, the Administrator shall give notice of the impact  
10 to the congressional delegation, Governor, and legislature  
11 of the State at least 45 days before the effective date of  
12 the covered action.

## 13 **TITLE VIII—ENERGY TAX** 14 **PREVENTION**

### 15 **SEC. 801. SHORT TITLE.**

16 This title may be cited as the “Energy Tax Preven-  
17 tion Act of 2012”.

### 18 **SEC. 802. NO REGULATION OF EMISSIONS OF GREENHOUSE** 19 **GASES.**

20 Title III of the Clean Air Act (42 U.S.C. 7601 et  
21 seq.) is amended by adding at the end the following:

### 22 **“SEC. 330. NO REGULATION OF EMISSIONS OF GREEN-** 23 **HOUSE GASES.**

24 “(a) DEFINITION.—In this section, the term ‘green-  
25 house gas’ means any of the following:

1 “(1) Water vapor.

2 “(2) Carbon dioxide.

3 “(3) Methane.

4 “(4) Nitrous oxide.

5 “(5) Sulfur hexafluoride.

6 “(6) Hydrofluorocarbons.

7 “(7) Perfluorocarbons.

8 “(8) Any other substance subject to, or pro-  
9 posed to be subject to, regulation, action, or consid-  
10 eration under this Act to address climate change.

11 “(b) LIMITATION ON AGENCY ACTION.—

12 “(1) LIMITATION.—

13 “(A) IN GENERAL.—The Administrator  
14 may not, under this Act, promulgate any regu-  
15 lation concerning, take action relating to, or  
16 take into consideration the emission of a green-  
17 house gas to address climate change.

18 “(B) AIR POLLUTANT DEFINITION.—The  
19 definition of the term ‘air pollutant’ in section  
20 302(g) does not include a greenhouse gas. Not-  
21 withstanding the previous sentence, such defini-  
22 tion may include a greenhouse gas for purposes  
23 of addressing concerns other than climate  
24 change.

1           “(2) EXCEPTIONS.—Paragraph (1) does not  
2       prohibit the following:

3           “(A) Notwithstanding paragraph (4)(B),  
4       implementation and enforcement of the rule en-  
5       titled ‘Light-Duty Vehicle Greenhouse Gas  
6       Emission Standards and Corporate Average  
7       Fuel Economy Standards’ (75 Fed. Reg. 25324  
8       (May 7, 2010) and without further revision)  
9       and finalization, implementation, enforcement,  
10      and revision of the proposed rule entitled  
11      ‘Greenhouse Gas Emissions Standards and  
12      Fuel Efficiency Standards for Medium- and  
13      Heavy-Duty Engines and Vehicles’ published at  
14      75 Fed. Reg. 74152 (November 30, 2010).

15          “(B) Implementation and enforcement of  
16      section 211(o).

17          “(C) Statutorily authorized Federal re-  
18      search, development, and demonstration pro-  
19      grams addressing climate change.

20          “(D) Implementation and enforcement of  
21      title VI to the extent such implementation or  
22      enforcement only involves one or more class I or  
23      class II substances (as such terms are defined  
24      in section 601).



1           “(E) Implementation and enforcement of  
2           section 821 (42 U.S.C. 7651k note) of Public  
3           Law 101–549 (commonly referred to as the  
4           ‘Clean Air Act Amendments of 1990’).

5           “(3) INAPPLICABILITY OF PROVISIONS.—Noth-  
6           ing listed in paragraph (2) shall cause a greenhouse  
7           gas to be subject to part C of title I (relating to pre-  
8           vention of significant deterioration of air quality) or  
9           considered an air pollutant for purposes of title V  
10          (relating to air permits).

11          “(4) CERTAIN PRIOR AGENCY ACTIONS.—The  
12          following rules, and actions (including any supple-  
13          ment or revision to such rules and actions) are re-  
14          pealed and shall have no legal effect:

15               “(A) ‘Mandatory Reporting of Greenhouse  
16               Gases’, published at 74 Fed. Reg. 56260 (Octo-  
17               ber 30, 2009).

18               “(B) ‘Endangerment and Cause or Con-  
19               tribute Findings for Greenhouse Gases under  
20               section 202(a) of the Clean Air Act’ published  
21               at 74 Fed. Reg. 66496 (Dec. 15, 2009).

22               “(C) ‘Reconsideration of the Interpretation  
23               of Regulations That Determine Pollutants Cov-  
24               ered by Clean Air Act Permitting Programs’  
25               published at 75 Fed. Reg. 17004 (April 2,

1           2010) and the memorandum from Stephen L.  
2           Johnson, Environmental Protection Agency  
3           (EPA) Administrator, to EPA Regional Admin-  
4           istrators, concerning ‘EPA’s Interpretation of  
5           Regulations that Determine Pollutants Covered  
6           by Federal Prevention of Significant Deteriora-  
7           tion (PSD) Permit Program’ (Dec. 18, 2008).

8           “(D) ‘Prevention of Significant Deteriora-  
9           tion and Title V Greenhouse Gas Tailoring  
10          Rule’, published at 75 Fed. Reg. 31514 (June  
11          3, 2010).

12          “(E) ‘Action To Ensure Authority To  
13          Issue Permits Under the Prevention of Signifi-  
14          cant Deterioration Program to Sources of  
15          Greenhouse Gas Emissions: Finding of Sub-  
16          stantial Inadequacy and SIP Call’, published at  
17          75 Fed. Reg. 77698 (December 13, 2010).

18          “(F) ‘Action To Ensure Authority To  
19          Issue Permits Under the Prevention of Signifi-  
20          cant Deterioration Program to Sources of  
21          Greenhouse Gas Emissions: Finding of Failure  
22          to Submit State Implementation Plan Revisions  
23          Required for Greenhouse Gases’, published at  
24          75 Fed. Reg. 81874 (December 29, 2010).

1           “(G) ‘Action To Ensure Authority To  
2           Issue Permits Under the Prevention of Signifi-  
3           cant Deterioration Program to Sources of  
4           Greenhouse Gas Emissions: Federal Implemen-  
5           tation Plan’, published at 75 Fed. Reg. 82246  
6           (December 30, 2010).

7           “(H) ‘Action To Ensure Authority To Im-  
8           plement Title V Permitting Programs Under  
9           the Greenhouse Gas Tailoring Rule’, published  
10          at 75 Fed. Reg. 82254 (December 30, 2010).

11          “(I) ‘Determinations Concerning Need for  
12          Error Correction, Partial Approval and Partial  
13          Disapproval, and Federal Implementation Plan  
14          Regarding Texas Prevention of Significant De-  
15          terioration Program’, published at 75 Fed. Reg.  
16          82430 (December 30, 2010).

17          “(J) ‘Limitation of Approval of Prevention  
18          of Significant Deterioration Provisions Con-  
19          cerning Greenhouse Gas Emitting-Sources in  
20          State Implementation Plans; Final Rule’, pub-  
21          lished at 75 Fed. Reg. 82536 (December 30,  
22          2010).

23          “(K) ‘Determinations Concerning Need for  
24          Error Correction, Partial Approval and Partial  
25          Disapproval, and Federal Implementation Plan

1           Regarding Texas Prevention of Significant De-  
2           terioration Program; Proposed Rule’, published  
3           at 75 Fed. Reg. 82365 (December 30, 2010).

4           “(L) Except for action listed in paragraph  
5           (2), any other Federal action under this Act oc-  
6           curring before the date of enactment of this  
7           section that applies a stationary source permit-  
8           ting requirement or an emissions standard for  
9           a greenhouse gas to address climate change.

10          “(5) STATE ACTION.—

11               “(A) NO LIMITATION.—This section does  
12           not limit or otherwise affect the authority of a  
13           State to adopt, amend, enforce, or repeal State  
14           laws and regulations pertaining to the emission  
15           of a greenhouse gas.

16          “(B) EXCEPTION.—

17               “(i) RULE.—Notwithstanding sub-  
18           paragraph (A), any provision described in  
19           clause (ii)—

20                       “(I) is not federally enforceable;

21                       “(II) is not deemed to be a part  
22           of Federal law; and

23                       “(III) is deemed to be stricken  
24           from the plan described in clause

1 (ii)(I) or the program or permit de-  
2 scribed in clause (ii)(II), as applicable.

3 “(ii) PROVISIONS DEFINED.—For pur-  
4 poses of clause (i), the term ‘provision’  
5 means any provision that—

6 “(I) is contained in a State im-  
7 plementation plan under section 110  
8 and authorizes or requires a limitation  
9 on, or imposes a permit requirement  
10 for, the emission of a greenhouse gas  
11 to address climate change; or

12 “(II) is part of an operating per-  
13 mit program under title V, or a per-  
14 mit issued pursuant to title V, and  
15 authorizes or requires a limitation on  
16 the emission of a greenhouse gas to  
17 address climate change.

18 “(C) ACTION BY ADMINISTRATOR.—The  
19 Administrator may not approve or make feder-  
20 ally enforceable any provision described in sub-  
21 paragraph (B)(ii).”.

22 **SEC. 803. PRESERVING ONE NATIONAL STANDARD FOR**  
23 **AUTOMOBILES.**

24 Section 209(b) of the Clean Air Act (42 U.S.C. 7543)  
25 is amended by adding at the end the following:

1           “(4) With respect to standards for emissions of  
2           greenhouse gases (as defined in section 330) for  
3           model year 2017 or any subsequent model year for  
4           new motor vehicles and new motor vehicle engines—

5                   “(A) the Administrator may not waive ap-  
6           plication of subsection (a); and

7                   “(B) no waiver granted prior to the date of  
8           enactment of this paragraph may be considered  
9           to waive the application of subsection (a).”.



HR 1837 PCS

**Calendar No. 332**  
112th CONGRESS  
2d Session  
**H. R. 1837**  
**IN THE SENATE OF THE UNITED STATES**

**March 1, 2012**

Received

**March 2, 2012**

Read the first time

**March 5, 2012**

Read the second time and placed on the calendar

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**AN ACT**

To address certain water-related concerns on the San Joaquin River, and for other purposes.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,*

**SECTION 1. SHORT TITLE; TABLE OF CONTENTS.**

(a) Short Title- This Act may be cited as the `Sacramento-San Joaquin Valley Water Reliability Act'.

(b) Table of Contents- The table of contents for this Act is as follows:  
Sec. 1. Short title; table of contents.

**~~TITLE I~~SUBTITLE A--CENTRAL VALLEY PROJECT WATER  
RELIABILITY**

Sec. 101. Amendment to purposes.

Sec. 102. Amendment to definition.

Sec. 103. Contracts.

Sec. 104. Water transfers, improved water management, and conservation.



- Sec. 105. Fish, wildlife, and habitat restoration.
- Sec. 106. Restoration fund.
- Sec. 107. Additional authorities.
- Sec. 108. Bay-Delta Accord.
- Sec. 109. Natural and artificially spawned species.
- Sec. 110. Authorized service area.
- Sec. 111. Regulatory streamlining.

## **~~TITLE I~~SUBTITLE B--SAN JOAQUIN RIVER RESTORATION**

- Sec. 201. Repeal of the San Joaquin River settlement.
- Sec. 202. Purpose.
- Sec. 203. Definitions.
- Sec. 204. Implementation of restoration.
- Sec. 205. Disposal of property; title to facilities.
- Sec. 206. Compliance with applicable law.
- Sec. 207. Compliance with Central Valley Project Improvement Act.
- Sec. 208. No private right of action.
- Sec. 209. Implementation.
- Sec. 210. Repayment contracts and acceleration of repayment of construction costs.
- Sec. 211. Repeal.
- Sec. 212. Water supply mitigation.
- Sec. 213. Additional Authorities.

## **~~TITLE I~~SUBTITLE C--REPAYMENT CONTRACTS AND ACCELERATION OF REPAYMENT OF CONSTRUCTION COSTS**

- Sec. 301. Repayment contracts and acceleration of repayment of construction costs.

## **~~TITLE IV~~SUBTITLE D--BAY-DELTA WATERSHED WATER RIGHTS PRESERVATION AND PROTECTION**

- Sec. 401. Water rights and area-of-origin protections.
- Sec. 402. Sacramento River settlement contracts.
- Sec. 403. Sacramento River Watershed Water Service Contractors.
- Sec. 404. No redirected adverse impacts.

## **~~TITLE V~~SUBTITLE E--MISCELLANEOUS**

- Sec. 501. Precedent.

## ~~TITLE~~ SUBTITLE A --CENTRAL VALLEY PROJECT WATER RELIABILITY

### SEC. ~~101~~ 511. AMENDMENT TO PURPOSES.

Section 3402 of the Central Valley Project Improvement Act (Public Law 102-575; 106 Stat. 4706) is amended--

(1) in subsection (f), by striking the period at the end; and

(2) by adding at the end the following:

`(g) to ensure that water dedicated to fish and wildlife purposes by this title is replaced and provided to Central Valley Project water contractors by not later than December 31, 2016, at the lowest cost reasonably achievable; and

`(h) to facilitate and expedite water transfers in accordance with this Act title.'.

### SEC. ~~102~~ 512. AMENDMENT TO DEFINITION.

Section 3403 of the Central Valley Project Improvement Act (Public Law 102-575; 106 Stat. 4707) is amended--

(1) by amending-striking subsection (a) to read as follows: and inserting the following:

~~`(a) the term `anadromous fish' means those native stocks of salmon (including steelhead) and sturgeon that, as of October 30, 1992, were present in the Sacramento and San Joaquin Rivers and their tributaries and ascend those rivers and their tributaries to reproduce after maturing in San Francisco Bay or the Pacific Ocean;'~~

~~(2) in subsection (l), by striking `and,'~~

~~(3) in subsection (m), by striking the period and inserting `; and', and~~

~~(4) by adding at the end the following:~~

`(a) the term `anadromous fish' means those native stocks of salmon (including steelhead) and sturgeon that—

“(1) as of October 30, 1992, were present in the Sacramento and San Joaquin Rivers and the tributaries of the Sacramento and San Joaquin Rivers; and

“(2) ascend those rivers and tributaries to reproduce after maturing in San Francisco Bay or the Pacific Ocean;”;

(2) by redesignating subsections (i) through (m) as subsections (j) through (n), respectively; and

(3) by inserting after subsection (h) the following:

~~`(n)-(i)~~ (i) the term `reasonable flows' means water flows capable of being maintained taking into account competing consumptive uses of water and economic, environmental, and social factors.'

## SEC. ~~103~~ 513. CONTRACTS.

Section 3404 of the Central Valley Project Improvement Act (Public Law 102-575; 106 Stat. 4708) is amended— to read as follows:

(1) ~~in the heading, by striking 'limitation on contracting and contract reform' and inserting 'contracts'; and~~

(2) ~~by striking the language of the section and by adding:~~

` (a) Renewal of Existing Long-Term Contracts- ~~Upon~~ On request of the contractor, the Secretary shall renew any existing long-term repayment or water service contract that provides for the delivery of water from the Central Valley Project for a period of 40 years.

` (b) Administration of Contracts- Except as expressly provided by this Act title, any existing long-term repayment or water service contract for the delivery of water from the Central Valley Project shall be administered pursuant to the Act of July 2, 1956 (chapter 492; 70 Stat. 483).

` (c) Delivery Charge- Beginning on the date of the enactment of this Act, a contract entered into or renewed pursuant to this section shall include a provision that requires the Secretary to charge ~~the any~~ other party to ~~such the~~ contract only for water actually delivered by the Secretary.'.

## SEC. ~~104~~ 514. WATER TRANSFERS, IMPROVED WATER MANAGEMENT, AND CONSERVATION.

Section 3405 of the Central Valley Project Improvement Act (Public Law 102-575; 106 Stat. 4709) is amended ~~as follows: --~~

(1) In subsection (a)--

(A) ~~by inserting before in the second sentence, by striking 'Except as provided herein' the following: and inserting~~

~~'The Secretary shall take all necessary actions actions necessary to facilitate and expedite transfers of Central Valley Project water in accordance with this Act title or any other provision of Federal reclamation law and the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.). Except as provided in this subsection,';~~

(B) in paragraph (1)(A), by striking 'to combination' and inserting 'or combination';

(C) in paragraph (2), by adding at the end the following:

~~'(E) Written Transfer Proposals.—~~

~~'(i) In General.--The contracting district from which the water is coming supplied, the agency, or the Secretary, as applicable, shall determine if whether a written transfer proposal is complete within not later than 45 days after the~~

date of submission of such proposal on which the proposal is submitted

~~“(ii) Determination.-- If such district or agency or the Secretary determines that such proposal is incomplete, such district or agency or the Secretary shall state with specificity what must be added to or revised in order for such proposal to be complete. The contracting district, the agency, or the Secretary determines that the proposal described in clause (i) is incomplete, the contracting district, agency, or Secretary shall state, in which the proposal would be considered complete.~~

~~“(F) Except as provided in this section, the Secretary shall not impose mitigation or other requirements on a proposed transfer, but the contracting district from which the water is coming or the agency shall retain all authority under State law to approve or condition a proposed transfer.”; and~~

~~“(F) No Mitigation Requirements.—~~

~~“(i) In General.—Except as provided in this section, the Secretary shall not impose mitigation of other requirements on a proposed transfer.~~

~~“(ii) Applicability.—This section shall have no effect on the authority of the contracting district from which the water is supplied or the agency under State law to approve or condition a proposed transfer.”; and~~

(D) by adding at the end the following:

“(4) Applicability.--Notwithstanding any other provision of Federal reclamation law--

“(A) the authority to ~~make transfers or exchanges of, or banking or recharge transfer, exchange, bank, or make recharging~~ arrangements using, Central Valley Project water that could have been ~~conducted~~ carried out before October 30, 1992, is valid, and ~~such those~~ transfers, exchanges, or arrangements shall not be subject to, limited, or conditioned by this title; and

“(B) this title shall not supersede or revoke the authority to transfer, exchange, bank, or recharge Central Valley Project water ~~that existed prior to~~ in effect before October 30, 1992.”.

(2) In subsection (b)--

(A) in the heading, by striking ‘METERING’ and inserting ‘MEASUREMENT’; and

~~(B) by inserting after the first sentence the following: ‘The contracting district or agency, not including contracting~~

~~districts serving multiple agencies with separate governing boards, shall ensure that all contractor-owned water delivery systems within its boundaries measure surface water at the district or agency's facilities up to the point the surface water is commingled with other water supplies.'.~~

~~(B) in the first sentence, by striking "All Central Valley" and inserting the following:~~

~~"(1) In General.—All Central Valley";~~

~~(C) in the second sentence, by striking "The contracting district" and inserting the following:~~

~~"(3) Annual Report.—The contracting district"; and~~

~~(D) by inserting after paragraph (1) (as designated by subparagraph (B)) the following:~~

~~"(2) Measurement Requirements.—The contracting district or agency, not including contracting districts serving multiple agencies with separate governing boards, shall ensure that all contractor-owned water delivery systems within boundaries of the contracting district or agency measure surface water at the facilities of the contracting district or agency up to the point at which the surface water is commingled with other water supplies.";~~

~~(3) By striking subsection (d);:~~

~~(4) By redesignating subsections (e) and (f) as subsections (d) and (e), respectively;:~~ and

~~(5) By amending striking subsection (e) (as redesignated by paragraph (4))—and inserting the following:~~

~~(A) by striking "as a result of the increased repayment" and inserting "that exceed the cost of service";~~

~~(B) by inserting "the delivery of" after "rates applicable to"; and~~

~~(C) by striking ", and all increased revenues received by the Secretary as a result of the increased water prices established under subsection 3405(d) of this section, '.~~

~~"(e) Increased Revenues.—All revenues received by the Secretary that exceed the cost-of-service rates applicable to the delivery of water transferred from irrigation use to municipal and industrial use under subsection (a) shall be covered to the Restoration Fund.".~~

## **SEC. ~~105~~15. FISH, WILDLIFE, AND HABITAT RESTORATION.**

Section 3406 of the Central Valley Project Improvement Act (Public Law 102-575; 106 Stat. 4714) is amended ~~as follows:--~~

(1) In subsection (b)--

(A) ~~in~~ by striking paragraph (1)(B)— and inserting the following:

~~(i) by striking 'is authorized and directed to' and inserting 'may';~~

~~(ii) by inserting 'reasonable water' after 'to provide';~~

~~(iii) by striking 'anadromous fish, except that such' and inserting 'anadromous fish. Such';~~

~~(iv) by striking 'Instream flow' and inserting 'Reasonable instream flow';~~

~~(v) by inserting 'and the National Marine Fisheries Service' after 'United States Fish and Wildlife Service'; and~~

~~(vi) by striking 'California Department of Fish and Game' and inserting 'United States Geological Survey';~~

"(B) Administration.—

"(i) In General.—As needed to carry out the goals of the Central Valley Project, the Secretary may modify Central Valley Project operations to provide reasonable flows of suitable quality, quantity, and timing to protect all life stages of anadromous fish.

"(ii) Requirements.—The flows under clause (i) shall be provided from the quantity of water dedicated to fish, wildlife, and habitat restoration purposes under paragraph (2) from the water supplies acquired pursuant to paragraph (3) and from other sources which do not conflict with fulfillment of the remaining contractual obligations of the Secretary to provide Central Valley Project water for other authorized purposes.

"(iii) Determination of needs.—The Secretary shall determine the instream reasonable flow needs for all Central Valley Project controlled streams and rivers based on recommendations of the United States Fish and Wildlife Service and the National Marine Fisheries Service after consultation with the United States Geological Survey.";  
and

(B) in paragraph (2)--

~~(i) by striking 'primary purpose' and inserting 'purposes'; in the matter preceding subparagraph (A)—~~

~~(I) in the first sentence, by striking "primary purpose" and inserting purposes";~~

~~(ii)(II) by striking 'but not limited to before 'additional obligations additional obligations under~~

the Federal Endangered Species Act' and inserting 'additional obligations under the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.); and

~~(iii)(III)~~ by adding after the period at the end the following: 'All Central Valley Project water used for the purposes specified in this paragraph shall be credited to the quantity of Central Valley Project yield dedicated and managed under this paragraph by determining how the dedication and management of such that water would affect the delivery capability of the Central Valley Project during the 1928 to 1934 drought period after fishery, water quality, and other flow and operational requirements imposed by terms and conditions existing in licenses, permits, and other agreements pertaining to the Central Valley Project under applicable State or Federal law existing on October 30, 1992, have been met. yield. To the fullest extent possible maximum extent practicable and in accordance with section 3411, Central Valley Project water dedicated and managed pursuant to this paragraph shall be reused to fulfill the Secretary's remaining contractual obligations of the Secretary to provide Central Valley Project water for agricultural or municipal and industrial purposes.'; and

~~(C) by amending paragraph (2)(C) to read:~~

(ii) by striking subparagraph (C) and inserting the following:

'(C) Mandatory Reduction.--If ~~by on~~ March 15th of ~~any a~~ given year, the quantity of Central Valley Project water forecasted to be made available to water service or repayment contractors in the Delta Division of the Central Valley Project is below less than 75 percent of the total quantity of water to be made available under ~~said those~~ contracts, the quantity of Central Valley Project yield dedicated and managed for that year under this paragraph shall be reduced by 25 percent.'; and

(2) By adding at the end the following:

'(i) SATISFACTION OF PURPOSES- ~~By pursuing the activities described in~~ In carrying out this section, the Secretary shall be ~~deemed considered~~ to have met the mitigation, protection, restoration, and enhancement purposes of this title.'

## **SEC. ~~1065~~16. RESTORATION FUND.**



(a) In General- Section 3407(a) of the Central Valley Project Improvement Act (Public Law 102-575; 106 Stat. 4726) is amended--~~as follows:--~~

~~(1) By inserting `(1) IN GENERAL` before `There is hereby`.~~

~~(2) By striking `Not less than 67 percent` and all that follows through `Monies` and inserting `Monies`.~~

~~(3) By adding at the end the following:~~

~~“(2) Prohibitions The Secretary may not directly or indirectly require a donation or other payment to the Restoration Fund—~~

~~(1) By striking “There is hereby” and inserting the following:~~

~~“(1) Establishment.—~~

~~“(A) In General.—There is”;~~

~~(2) in paragraph (1)(A) (as designated by paragraph (1)), by striking “Not less than 67 percent” and all that follows through “Monies” and inserting the following:~~

~~“(B) Use of Donated Amounts.—Amounts”; and~~

~~(3) by adding at the end the following:~~

~~“(2) Restrictions.—The Secretary may not directly or indirectly require a donation or other payment (including environmental restoration or mitigation fees not otherwise provided by law) to the Restoration Fund--~~

~~“(A) or environmental restoration or mitigation fees not otherwise provided by law, as a condition to as a condition of--~~

~~“(i) providing for the storage or conveyance of non-Central Valley Project water pursuant to Federal reclamation laws; or~~

~~“(ii) the delivery of water pursuant to section 215 of the Reclamation Reform Act of 1982 (Public Law 97-293; 96 Stat. 1270); or~~

~~“(B) for any water that is delivered with the sole intent of groundwater recharge.”.~~

(b) Certain Payments-- Section 3407(c)(1) of the Central Valley Project Improvement Act (Public Law 102-575; 106 Stat. 4726) is amended--

(1) by striking `mitigation and restoration payments, in addition to charges provided for or` and inserting `payments, in addition to charges`; and

~~(2) by striking `provided for or`;~~ and

~~(3)(2) by striking `of fish, wildlife` and all that follows through the period and inserting `of carrying out all activities described in~~ this title.’.

(c) Adjustment and Assessment of Mitigation and Restoration Payments.-- Section 3407(d)~~(2)~~ of the Central Valley Project Improvement Act (Public Law 102-575; 106 Stat. 4727) is amended--



by inserting `~~`, or after October 1, 2013, \$4 per megawatt hour for Central Valley Project power sold to power contractors (October 2013 price levels)` after `~~\$12 per acre foot (October 1992 price levels) for municipal and industrial water sold and delivered by the Central Valley Project`.~~~~

~~(d) Completion of Actions—Section 3407(d)(2)(A) of the Central Valley Project Improvement Act is amended by inserting `no later than December 31, 2020,` after `That upon the completion of the fish, wildlife, and habitat mitigation and restoration actions mandated under section 3406 of this title,`.~~

~~(e) Report; Advisory Board—Section 3407 of the Central Valley Project Improvement Act (106 Stat. 4714) is amended by adding at the end the following:~~

~~(1) in paragraph (2)(A)—~~

~~(A) by striking ``, and \$12 per acre-foot (October 1992 price levels) for municipal and industrial water sold and delivered by the Central Valley Project` and inserting `\$12 per acre-foot (October 1992 price levels) for municipal and industrial water sold and delivered by the Central Valley Project, and after October 1, 2013, \$4 per megawatt-hour for Central Valley Project power sold to power contractors (October 2013 price levels)`; and~~

~~(B) by inserting `but not later than December 31, 2020,` after `That upon the completion of the fish, wildlife, and habitat mitigation and restoration actions mandated under section 3406 of this title,`; and~~

~~(2) by adding at the end the following:~~

~~`(g) Report on Expenditure of Funds—~~

~~“(1) In General.-- At the end of For each fiscal year, the Secretary, in consultation with the ~~Restoration Fund~~ Advisory Board, shall submit to Congress a plan for the expenditure of all of the funds deposited into the Restoration Fund during the preceding fiscal year.~~

~~“(2) Contents.--Such The plan shall ~~contain a cost effectiveness analysis~~include an analysis of the cost-effectiveness of each expenditure.~~

~~`(h) Advisory Board.--~~

~~(1) ESTABLISHMENT.-- There is ~~hereby~~ established the Restoration Fund Advisory Board (~~hereinafter referred to~~ in this section ~~referred to~~ as the `Advisory Board') which shall be composed of 12 members ~~selected~~ appointed by the Secretary, ~~each for four year terms, one of whom shall be designated by the Secretary as Chairman. The members shall be selected so as to represent the various Central Valley Project stakeholders, four of whom shall be from CVP agricultural users, three from CVP~~~~

~~municipal and industrial users, three from CVP power contractors, and two at the discretion of the Secretary. The Secretary and the Secretary of Commerce may each designate a representative to act as an observer of the Advisory Board.~~

~~“(2) Membership.—~~

~~“(A) In General.—The Secretary shall appoint members to the Advisory Board that represent the various Central Valley Project stakeholders, of whom—~~

~~“(i) 4 members shall be agricultural users of the Central Valley Project;~~

~~“(ii) 3 members shall be municipal and industrial users of the Central Valley Project;~~

~~“(iii) 3 members shall be power contractors of the Central Valley Project; and~~

~~“(iv) 2 members shall be appointed at the discretion of the Secretary.~~

~~“(B) Observers.—The Secretary and the Secretary of Commerce may each designate a representative to act as an observer of the Advisory Board.~~

~~“(C) Chairman.—The Secretary shall appoint 1 of the members described in subparagraph (A) to serve as Chairman of the Advisory Board.~~

~~“(3) Terms.—The term of each member of the Advisory Board shall be for a period of 4 years.~~

~~“(2)“(4) DUTIES- The duties of the Advisory Board are as follows:--~~

~~“(A) ~~To to~~ meet ~~at least~~not less frequently than semiannually to develop and make recommendations to the Secretary regarding priorities and spending levels on projects and programs carried out pursuant to the Central Valley Project Improvement Act under this title;~~

~~“(B) ~~To to~~ ensure that any advice given or recommendation made by the Advisory Board to the Secretary reflects the independent judgment of the Advisory Board;:~~

~~“(C) ~~Not not~~ later than December 31, 2013, and annually thereafter, to ~~transmit submit~~ to the Secretary and Congress the recommendations required under subparagraph (A).); and~~

~~“(D) ~~Not not~~ later than December 31, 2013, and biennially thereafter, to ~~transmit submit~~ to Congress a report that details the progress made in achieving the actions mandated required under section 3406 of this title.~~

~~“(3)(5) ADMINISTRATION.-- With the consent of the appropriate agency head, the Advisory Board may use the facilities and services of any Federal agency.’.~~

## SEC. ~~107~~517. ADDITIONAL AUTHORITIES.

(a) Authority for Certain Activities.-- Section 3408(c) of the Central Valley Project Improvement Act (Public Law 102-575; 106 Stat. 4728) is amended ~~to read as follows:~~by striking subsection (c) and inserting the following:

` (c) Contracts for Additional Storage and Delivery of Water.--

` (1) IN GENERAL- The Secretary ~~is authorized to may~~ enter into contracts ~~pursuant to Federal~~under the reclamation laws and this title with any Federal agency, California water user or water agency, State agency, or private organization for the exchange, impoundment, storage, carriage, and delivery of nonproject water for domestic, municipal, industrial, fish and wildlife, and any other beneficial purpose.

` (2) LIMITATION.-- Nothing in this subsection ~~shall be deemed to supersede the provisions of section 103 of Public Law 99-546~~supersedes section 2(d) of the Act of August 26, 1937 (chapter 832; 50 Stat. 850; 100 Stat. 3051).

` (3) AUTHORITY FOR CERTAIN ACTIVITIES.-- The Secretary shall use the authority granted by this subsection in connection with requests to exchange, impound, store, carry, or deliver nonproject water using Central Valley Project facilities for any beneficial purpose.

` (4) RATES.--

"(A) In General.--The Secretary shall develop rates not to exceed the amount required to recover the reasonable costs incurred by the Secretary in connection with a beneficial purpose under this subsection.

"(B) Administration.--Such-The rates shall be charged to a party using Central Valley Project facilities for such a beneficial purpose-, but the costs described in subparagraph (A) Such costs-shall not include any donation or other payment to the Restoration Fund.

` (5) CONSTRUCTION.-- This subsection shall be construed and implemented to facilitate and encourage the use of Central Valley Project facilities to exchange, impound, store, carry, or deliver nonproject water for any beneficial purpose.'.

(b) Reporting Requirements.-- Section 3408(f) of the Central Valley Project Improvement Act (Public Law 102-575; 106 Stat. 4729) is amended--

(1) in the first sentence by striking `Interior and Insular Affairs and the Committee on Merchant Marine and Fisheries' and inserting `Natural Resources';

(2) in the second sentence, by inserting ~~before the period at the end the following:~~ ` , including progress on the plan required by subsection (j)' before the period at the end; and

(3) by adding at the end the following: `The filing and adequacy of ~~such the~~ report shall be personally certified to the Committees ~~referenced above~~ by the Regional Director of the Mid-Pacific Region of the Bureau of Reclamation.'.

(c) Project Yield Increase.-- Section 3408(j) of the Central Valley Project Improvement Act (Public Law 102-575; 106 Stat. 4730) is amended ~~as follows:~~--

(1) By redesignating paragraphs (1) through (7) as subparagraphs (A) through (G), respectively, and indenting appropriately;

(2) By striking `In order to minimize adverse effects, if any, upon' and inserting the following:

`(1) IN GENERAL.-- In order to minimize adverse effects upon':;

(3) in the second sentence, by striking "The plan" and all that follows through "options:" and inserting the following:

"(2) Contents.—The plan shall include recommendations on appropriate cost-sharing arrangements and authorizing legislation or other measures needed to implement the intent, purposes, and provisions of this subsection, as well as a description of how the Secretary intends to use—";

(4) in paragraph (1) (as designated by paragraph (2))—

~~(3)(A) By~~ by striking `needs, the Secretary, shall' and all that follows through `submit to the Congress, ~~a~~' and inserting `needs, the Secretary, on a priority basis and not later than September 30, 2013, shall submit to Congress ~~a~~':; and

~~(4)(B) By~~ by striking `increase,' and all that follows through ~~"options:"~~ "under this title" and inserting `increase, as soon as possible-practicable but not later than September 30, 2016 (except for the construction of new facilities which shall not be limited by that deadline), the water of the Central Valley Project by the amount-quantity dedicated and managed for fish and wildlife purposes under this title and otherwise required to meet the purposes of the Central Valley Project, including satisfying contractual obligations"; ~~The plan required by this subsection shall include recommendations on appropriate cost-sharing arrangements and authorizing legislation or other measures needed to implement the intent, purposes, and provisions of this subsection and a description of how the Secretary intends to use the following options—~~'.

(5) ~~In subparagraph in paragraph (2)(A) (as designated by paragraph (1))~~, by inserting ` and construction of new water storage facilities' before the semicolon-;

(6) ~~In subparagraph in paragraph (2)(F) (as designated by paragraph (1))~~, by striking ` and' at the end-;

(7) ~~In subparagraph in paragraph (2)(G) (as designated by paragraph (1))~~, by striking the period and all that follows through the end of the subsection and inserting ` ; and'-; and

(8) ~~By inserting after subparagraph~~ by adding after paragraph (2)(G) the following:

` (H) Water banking and recharge.'-

~~(9) By adding at the end the following:~~

~~(2) (3) IMPLEMENTATION OF PLAN.~~-

"(A) In General.--The Secretary shall implement the plan ~~required by under~~ paragraph (1) ~~commencing beginning~~ on October 1, 2013.

"(B) Coordination.--In ~~order to carry~~ carrying out this subsection, the Secretary shall coordinate with the State of California in implementing measures for the long-term resolution of problems in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary.

~~(3) (4) FAILURE OF THE PLAN.--~~ Notwithstanding any other provision of ~~Federal the~~ reclamation laws, if by September 30, 2016, the plan ~~required by under~~ paragraph (1) fails to increase the annual delivery capability of the Central Valley Project by 800,000 acre-feet, implementation of any non-mandatory action under section 3406(b)(2) shall be suspended until the plan date on which the plan achieves an increase in the annual delivery capability of the Central Valley Project ~~by of~~ 800,000 acre-feet.'.

(d) Technical Correctionss.-- Section 3408(h) of the Central Valley Project Improvement Act (Public Law 102-575; 106 Stat. 4729) is amended-

(1) in paragraph (1), by striking ` paragraph (h)(2)' and inserting ` paragraph (2)'; and

(2) in paragraph (2), by striking ` paragraph (h)(i)' and inserting ` paragraph (1)'.

(e) Water Storage Project Construction.-- The Secretary of the Interior, acting through the Commissioner of ~~the Bureau of~~ Reclamation, may partner or enter into an agreement ~~on relating to~~ the water storage projects ~~identified described~~ in section 103(d)(1) of the Water Supply, Reliability, and Environmental Improvement Act (Public Law 108-361; 118 Stat. 1684) ~~(and Acts supplemental and amendatory to the Act)~~ with local joint powers authorities formed ~~pursuant to under~~ State law by irrigation districts and other local water

~~districts governments and local governments~~ or water districts within the applicable hydrological region, to advance ~~these projects~~ those water storage projects.

(2) No Additional Federal Amounts.—

(A) In General.—Subject to subparagraph (B), No additional Federal funds are authorized for the activities authorized in sections 103(d)(1)(A)(i), 103(d)(1)(A)(ii), and 103(d)(1)(A)(iii) of Public Law 108-361. However, each water storage project under sections 103(d)(1)(A)(i), 103(d)(1)(A)(ii), and 103(d)(1)(A)(iii) of Public Law 108-361 is authorized for construction if non-Federal funds are used for financing and constructing the project. No additional Federal amounts are authorized to be appropriated to carry out the activities described in clauses (i) through (iii) of sections 103(d)(1)(A) of the Water Supply, Reliability, and Environmental Improvement Act (Public Law 108-361; 118 Stat. 1684) Public Law 108-361.

(B) Expectation.—Additional Federal amounts may be appropriated for construction of a project described in subparagraph (A) if non-Federal amounts are used to finance and construct the project.

## **SEC. ~~108~~518. BAY-DELTA ACCORD.**

(a) Congressional Direction Regarding Central Valley Project and California State Water Project Operations.—

(1) In General.—The Central Valley Project and the California State Water Project shall be operated pursuant to strictly in accordance with the water quality standards and operational constraints described in the 'Principles for Agreement on the Bay-Delta Standards Between the State of California and the Federal Government' dated December 15, 1994, and such operations shall proceed without regard to the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) or any other law pertaining to the operation of the Central Valley Project and the California State Water Project. Implementation of this section shall be in strict conformance with the 'Principles for Agreement on the Bay-Delta Standards Between the State of California and the Federal Government' dated December 15, 1994.

(2) Applicability of Other Law.—The Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) and other applicable law shall not apply to operations described in paragraph (1).

(3) Implementation.—Implementation of the "Principles for Agreement on the Bay-Delta Standards Between the State of California and the Federal Government" dated December 15, 1994, shall be in



strict compliance with the water rights priority system and statutory protections for areas of origin.

(b) Application of Laws to Others.-- ~~Neither a Federal department nor the State of California, As a condition of the receipt of Federal amounts for the Central Valley Project and the California State Water Project, the State of California (including any agency or board of the State of California,) shall impose on any water right obtained pursuant to State law, including a pre-1914 appropriative right, shall not—~~

(A) impose any condition that restricts the exercise of that water right that is affected by the operations of the Central Valley Project of California State Water Project;

(B) restrict under the Public Trust Doctrine any public trust value imposed in order to conserve, enhance, recover or otherwise protect any species, that is affected by operations of the Central Valley Project or California State Water Project. Nor shall the State of California, including any agency or board of the State of California, restrict the exercise of any water right obtained pursuant to State law, including a pre-1914 appropriative right, in order to protect, enhance, or restore under the Public Trust Doctrine any public trust value.  
~~Implementation of the 'Principles for Agreement on the Bay-Delta Standards Between the State of California and the Federal Government' dated December 15, 1994, shall be in strict compliance with the water rights priority system and statutory protections for areas of origin.~~

(2) Federal Agencies.—The prohibition under paragraph (1)(A) shall apply to Federal agencies.

(c) Costs.-- No cost associated with the implementation of this section shall be imposed directly or indirectly on any Central Valley Project contractor, or any other person or entity, unless ~~such~~ those costs are incurred on a voluntary basis.

(d) Native Species Protection.—This section preempts any law of the State of California law is preempted with respect to any restriction on restricting the quantity or size of a nonnative fish that is taken or harvested that preys upon one on 1 or more native fish species that occupy the Sacramento and San Joaquin Rivers and their tributaries of those rivers or the Sacramento-San Joaquin Rivers Delta.

## **SEC. ~~1095~~19. NATURAL AND ARTIFICIALLY SPAWNED SPECIES.**

After the date of the enactment of this ~~title~~ Act, and regardless of the date of listing, the Secretaries of the Interior and Commerce shall not distinguish between natural-spawned and hatchery-spawned (or otherwise

artificially propagated strains of a species) in making any determination under the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) that relates to any anadromous fish species present in the Sacramento and San Joaquin Rivers or their tributaries and of those rivers and that ascends those rivers and their tributaries to reproduce after maturing in San Francisco Bay or the Pacific Ocean.

## **SEC. ~~110~~520. AUTHORIZED SERVICE AREA.**

~~The authorized service area of the Central Valley Project shall include the area within the boundaries of the Kettleman City Community Services District, California, as those boundaries exist on the date of the enactment of this title.~~

(a) In General.—The Secretary of the Interior, acting through the Commissioner of Reclamation, shall include in the service area of the Central Valley Project authorized under the Central Valley Project Improvement Act (Public Law 102-575; 106 Stat. 4706) the area within the boundaries of the Kettleman City Community Services District, California, as those boundaries are defined as of the date of enactment of this Act.

~~Notwithstanding the provisions of the Act of October 30, 1992 (Public Law 102-575, 106 Stat. 4600 et seq.), upon enactment of this title, the Secretary is authorized and directed to enter into a long-term contract in accordance with the reclamation laws with the Kettleman City Community Services District, California, for the delivery of up to 900 acre-feet of Central Valley Project water for municipal and industrial use.~~

(b) Long-Term Contract.—

(1) In General.—Notwithstanding the Central Valley Project Improvement Act (Public Law 102-575; 106 Stat. 4706) and subject to paragraph (2), the Secretary, in accordance with the reclamation laws, shall enter into a long-term contract with the Kettleman City Community Services District or the delivery of not more than 900 acre-feet of Central Valley Project water for municipal and industrial use.

(2) Reduction in Contract.—The Secretary may temporarily reduce deliveries of the quantity of water made available ~~pursuant to~~ up to under paragraph (1) by not more than 25 percent of ~~such the~~ total whenever reductions due to hydrologic circumstances are imposed ~~upon on~~ agricultural deliveries of Central Valley Project water.

(c) Additional Cost.— If any additional infrastructure or related costs are needed to implement this section, ~~such those~~ costs shall be the responsibility of the non-Federal entity.

## **SEC. ~~111~~521. REGULATORY STREAMLINING.**



(a) Definitions.—In this section:

(1) CVP- The term `CVP' means the Central Valley Project.

(2) PROJECT- The term `project'--

(A) means an activity that--

(i) is undertaken by a public agency, funded by a public agency, or that requires an issuance of a permit by a public agency;

(ii) has a potential to result in physical change to the environment; and

(iii) may be subject to several discretionary approvals by governmental agencies;

(B) may include construction activities, clearing or grading of land, improvements to existing structures, and activities or equipment involving the issuance of a permit; or

(C) as defined under the California Environmental Quality Act in section 21065 of the California Public Resource Code.

(b) Applicability of Certain Laws.-- The Filing-filing of a Notice of Determination-determination or a Notice-notice of Exemption exemption for any project, including the issuance of a permit under State law, related tofor any project of the CVP or the delivery of water therefrom in-the CVP in accordance with the California Environmental Quality Act shall be deemed-considered to meet the requirements of for that project or permit under section 102(2)(C) of the National Environmental Protection Act of 1969 (42 U.S.C. 4332(2)(C)). for that project or permit.

(b)(c) Continuation of Project.-- The Bureau of Reclamation shall not be required to cease or modify any major Federal action or other activity related tofor any project of the CVP or the delivery of water therefrom the CVP pending completion of judicial review of any determination made under the National Environmental Protection Act of 1969 (42 U.S.C. 4332(2)(C)4321 et seq.).

(c) Project Defined—For the purposes of this section:

(1) CVP—The term `CVP' means the Central Valley Project.

(2) PROJECT—The term `project'—

(A) means an activity that—

(i) is undertaken by a public agency, funded by a public agency, or that requires an issuance of a permit by a public agency;

(ii) has a potential to result in physical change to the environment; and

(iii) may be subject to several discretionary approvals by governmental agencies;

~~(B) may include construction activities, clearing or grading of land, improvements to existing structures, and activities or equipment involving the issuance of a permit; or  
(C) as defined under the California Environmental Quality Act in section 21065 of the California Public Resource Code.~~

## ~~TITLE H~~Subtitle B--SAN JOAQUIN RIVER RESTORATION

### SEC. ~~2015~~31. REPEAL OF THE SAN JOAQUIN RIVER SETTLEMENT.

As of the date of enactment of this ~~title~~Act, the Secretary shall cease any action to implement the Stipulation of Settlement, ~~{Natural Resources Defense Council, et al. v. Kirk Inc. V. Rodgers, et al., Eastern District of California, No. Civ. S-88-1658 LKK/GGH} (E.D. Cal. Sept. 13, 2006).~~

### SEC. ~~2025~~32. PURPOSE.

Section 10002 of the San Joaquin River Restoration Settlement Act (Public Law 111-11; 123 Stat. 1349) is amended by striking 'implementation of the Settlement' and inserting 'restoration of the San Joaquin River'.

### SEC. ~~2035~~33. DEFINITIONS.

Section 10003 of the San Joaquin River Restoration Settlement Act (Public Law 111-11; 123 Stat. 1349) is amended—

(1) by redesignating paragraphs (2) and (3) as paragraphs (3) and (4), respectively;

~~(1)(2)~~ by striking paragraph (1) and inserting the following:

'(1) Critical Water Year.--The term 'critical water year' means when the total unimpaired runoff at Friant Dam is less than 400,000 acre-feet, as forecasted as of March 1 of that water year by the California Department of Water Resources.

~~(2) by striking paragraph (3) and inserting the following:~~

~~'(3) The term 'Water Year' means March 1 through the last day of February of the following Calendar Year, both dates inclusive.'; and~~

~~(3) by adding at the end the following new paragraph:~~

~~'(4) The term 'Critical Water Year' means when the total unimpaired runoff at Friant Dam is less than 400,000 acre feet,~~

~~as forecasted as of March 1 of that water year by the California Department of Water Resources.'~~

`(2) Restoration Flows.--The term `Restoration Flows' means the additional water released or bypassed from Friant Dam to insure ensure that the target flow entering Mendota Pool, located approximately 62 river miles downstream from Friant Dam, does not fall below 50 cubic feet per second.'

(3) by striking paragraph (4) (as redesignated by paragraph (1)) and inserting the following:

`(4) Water year.—The term `water year' means the period beginning March 1 of a given year and ending on the last day of February of the following calendar year.'

## **SEC. ~~204~~534. IMPLEMENTATION OF RESTORATION.**

Section 10004 of the San Joaquin River Restoration Settlement Act (Public Law 111-11; 123 Stat. 1350) is amended--

(1) in subsection (a)--

(A) ~~in the matter preceding paragraph (1),~~ by striking `hereby authorized and directed' and all that follows through `in the Settlement:' and inserting `authorized to may carry out the following:';

(B) by striking paragraphs (1), (2), (4), and (5);

(C) ~~in by redesignating~~ paragraph (3) as paragraph (1)--

~~(i) by striking `(3)' and inserting `(1)'; and~~

~~(ii)(D) in paragraph (1) (as redesignating by subparagraph (C)),~~ by striking `paragraph 13 of the Settlement' and inserting `this part'; and

~~(D)(E)~~ by adding at the end the following ~~new paragraphs~~:

`(2) In each Water Year, commencing beginning in the Water Year starting on March 1, 2013, the Secretary--

`(A) shall modify Friant Dam operations so as to release the Restoration Flows for that Water Year, except in anyunless the year is a Critical Water Year;

`(B) shall ensure that--

`(i) the release of Restoration Flows are maintained at the level prescribed by this part--; and

`(ii) but that Restoration Flows do not reach downstream of Mendota Pool;

`(C) shall release the Restoration Flows in a manner that improves the fishery in the San Joaquin River below Friant

Dam, ~~but~~ and upstream of Gravelly Ford, Nevada, as in existence as ~~of on~~ the date of the enactment of ~~this part,~~ and the Sacramento and San Joaquin Valleys Water Reliability Act, including the associated riparian habitat; and

`(D) may, without limiting the actions required under subparagraphs (A) and (C) and subject to subsections 10004(a)(3) and 10004(i) paragraph (3) and subsection (1), use the Restoration Flows to enhance or restore a warm water fishery downstream of Gravelly Ford, Nevada, ~~to and~~ including to Mendota Pool, if the Secretary determines that it the action is reasonable, prudent, and feasible ~~to do so; and.~~

`(3) Not later than 1 year after the date of the enactment of ~~this section~~ the Sacramento and San Joaquin Valleys Water Reliability Act, the Secretary shall develop and implement, in cooperation with the State of California, a reasonable plan, ~~--~~

`(A) to fully recirculate, recapture, reuse, exchange, or transfer all Restoration Flows; and

`(B) to provide ~~such the~~ recirculated, recaptured, reused, exchanged, or transferred flows to those contractors within the Friant Division, Hidden Unit, and Buchanan Unit of the Central Valley Project that relinquished the Restoration Flows ~~so that~~ were recirculated, recaptured, reused, exchanged, or transferred.

`(4) Such a plan shall The plan described in paragraph (3) shall--

`(A) address any impact on ground-water resources within the service area of the Friant Division, Hidden Unit, and Buchanan Unit of the Central Valley Project and mitigation may include ground-water banking and recharge projects; and

`(B) Such a plan shall not impact the water supply or water rights of any entity outside the Friant Division, Hidden unit, and Buchanan Unit of the Central Valley Project; and

`(C) Such a plan shall be subject to applicable provisions of California water law and the use by the Secretary's ~~use~~ of the Interior of Central Valley Project facilities to make Project water (other than water released from Friant Dam ~~pursuant to~~ under this part) and water acquired through transfers available to existing south-of-Delta Central Valley Project contractors.';

(2) in subsection (b)--

(A) in paragraph (1), by striking `the Settlement' and inserting `this part'; and

(B) in paragraph (2), by striking `the Settlement' and inserting `this part';

(3) in subsection (c), by striking `the Settlement' and inserting `this part';

(4) by striking subsection (d) and inserting the following:

`(d) Mitigation of Impacts.--~~Prior to October 1, 2013, the Secretary shall identify--~~

`(1) In General.—Not later than October 1, 2013 and subject to paragraph (2), the Secretary shall identify--

~~`(1)(A)~~ the impacts associated with the release of Restoration Flows prescribed in this part; and

~~`(2)(B)~~ the measures ~~which shall to~~ be implemented to mitigate impacts on adjacent and downstream water users, landowners, and agencies as a result of Restoration Flows ~~prescribed in this part; and.~~

~~`(3)(2) Mitigation Measures.-- prior to the implementation of decisions or agreements~~ Before implementing a decision or agreement to construct, improve, operate, or maintain ~~facilities~~ a facility that the Secretary determines are needed to implement this part, the Secretary shall implement all mitigations measures identified in subsection (d)(2) paragraph (1)(B) before the date on which Restoration Flows are commenced.';

(5) in subsection (e), by striking `the Settlement' and inserting `this part';

(6) in subsection (f), by striking `the Settlement' and ~~all that follows through~~ section 10011 and inserting this part;

(7) in subsection (g)--

(A) by striking `the Settlement and' ~~before this part~~; and

(B) by striking `or exchange contract' and inserting `exchange contract, ~~or~~ water rights settlement, or holding contracts';

(8) in subsection (h)--

(A) by striking `Interim' in the header;

(B) in paragraph (1)--

(i) in the matter preceding subparagraph (A), by striking `Interim Flows under the Settlement' and inserting `Restoration Flows under this part';

(ii) in subparagraph (C)--

(I) in clause (i), by striking `Interim' and inserting `Restoration'; and

(II) in clause (ii), by inserting `and' after the semicolon;

(iii) in subparagraph (D), by striking `and' at the end; and

(iv) by striking subparagraph (E);

(C) in paragraph (2) and inserting the following:—

- ~~(i) by striking 'Interim' and inserting 'Restoration';~~
- ~~(ii) by striking subparagraph (A); and~~
- ~~(iii) by striking '(B) exceed' and inserting 'exceed';~~

'(2) Conditions for Release.—The Secretary may release Restoration Flows to the extent that the flows would not exceed existing downstream channel capacities.'

(D) in paragraph (3), by striking 'Interim' and inserting 'Restoration'; and

(E) by striking paragraph (4) and inserting the following:

'(4) CLAIMS.-- Within Not later than 60 days after the date of enactment of this the Sacramento and San Joaquin Valleys Water Reliability Act, the Secretary shall promulgate a rule establishing a claims process to address current and future claims including, but not limited to, issue, by regulation, a claims process to address claims, including ground-water seepage, flooding, or levee instability damages caused as a result of, arising out of, or related to implementation of this subtitle A of title X of Public Law 111 11.'

(9) in subsection (i)--

(A) in paragraph (1)--

(i) in the matter preceding subparagraph (A), by striking 'the Settlement and parts I and III' and inserting 'this part';

(ii) in subparagraph (A), by inserting 'and' after the semicolon;

(iii) in subparagraph (B)--

(I) by striking 'additional amounts authorized to be appropriated, including the'; and

(II) by striking ' ; and' and inserting a period; and

(iv) by striking subparagraph (C); and

(B) by striking paragraph (3); and

(10) by adding at the end the following ~~new subsections~~:

'(k) No Impacts on Other Interests.—

'(1) In General.--No Central Valley Project or other water (other than San Joaquin River water impounded by or bypassed from Friant Dam) shall be used to implement subsection (a)(2) unless ~~such the~~ use is on a voluntary basis.

'(2) Involuntary Costs.-- No cost associated with the implementation of this section shall be imposed directly or indirectly on any Central Valley Project contractor, or any other person or entity, outside the Friant Division, the Hidden Unit, or the Buchanan Unit, unless ~~such the costs are is~~ incurred on a voluntary basis.

'(3) Reduction in Water Supplies.-- The implementation of this part shall not ~~result~~ directly or indirectly ~~in any reduction in water supplies~~reduce any water supply or water reliability on any Central Valley Project contractor, any State Water Project contractor, or any other person or entity, outside the Friant Division, the Hidden Unit, or the Buchanan Unit, unless such reductions or costs ~~are~~is incurred on a voluntary basis.

'(l) Priority.-- ~~All~~Each actions taken under this part shall be subordinate to the use by the Secretary's ~~use~~ of Central Valley Project facilities to make Project water available to Project contractors, other than water released from the Friant Dam ~~pursuant to~~under this part.

'(m) Applicability.--

'(1) In General.-- Notwithstanding section 8 of the Reclamation Act of June 17, 1902 (32 Stat. 390, chapter 1093), except as provided in this part, ~~including title IV and subtitle D~~ of the Sacramento and San Joaquin Valleys Water Reliability Act, this part--

'(A) preempts and supersedes any State law, regulation, or requirement that imposes more restrictive requirements or regulations on the activities authorized under this part; ~~and~~

'(B) Nothing in this part shall~~does not~~ alter or modify the any obligation~~s, if any,~~ of the Friant Division, Hidden Unit, and Buchanan Unit of the Central Valley Project, or other water users on the San Joaquin River, ~~or its~~ tributaries of the San Joaquin River, under ~~orders any~~ order issued by the State Water Resources Control Board ~~pursuant to~~under the Porter-Cologne Water Quality Control Act (California Water Code sections 13000 et seq.). ~~Any such order~~

'(2) Applicability.-- An order described in paragraph (1)(B) shall be consistent with ~~the any~~ congressional authorization for any affected Federal facility as it pertains to the Central Valley Project.

'(n) Project Implementation.-- Any Projects to implement this ~~title part~~ shall be phased such that each project shall ~~follow the sequencing identified below and include at least the~~include--

- '(1) the project purpose and need;
- '(2) identification of mitigation measures;
- '(3) appropriate environmental review; and

'(4) prior to releasing Restoration Flows under this part, ~~the Secretary shall--~~  
~~'(A) complete the implementation of mitigation measures required; and the completion of any required mitigation measures and completion of the project.'~~

~~'(B) complete implementation of the project.'~~



## **SEC. ~~205~~535. DISPOSAL OF PROPERTY; TITLE TO FACILITIES.**

Section 10005 of the San Joaquin River Restoration Settlement Act (Public Law 111-11; 123 Stat. 1353) is amended--

- (1) in subsection (a), by striking `the Settlement authorized by this part' and inserting `this part';
- (2) in subsection (b)--
  - (A) in paragraph (1)--
    - (i) by striking `(1) IN GENERAL.-- The Secretary' and inserting `The Secretary'; and
    - (ii) by striking `the Settlement authorized by this part' and inserting `this part'; and
  - (B) by striking paragraph (2); and
- (3) in subsection (c)--
  - (A) in paragraph (1), by striking `the Settlement' and inserting `this part';
  - (B) in paragraph (2)--
    - (i) by striking `through the exercise of its eminent domain authority'; and
    - (ii) by striking `the Settlement' and inserting `this part'; and
  - (C) in paragraph (3), by striking `section 10009(c)' and inserting `section 10009'.

## **SEC. ~~206~~536. COMPLIANCE WITH APPLICABLE LAW.**

Section 10006 of the San Joaquin River Restoration Settlement Act (Public Law 111-11; 123 Stat. 1354) is amended--

- (1) in subsection (a)--
  - (A) in paragraph (1), by inserting `unless otherwise provided by this part' before the period at the end; and
  - (B) in paragraph (2), by striking `the Settlement' and inserting `this part';
- (2) in subsection (b), by inserting `, unless otherwise provided by this part' before the period at the end;
- (3) in subsection (c)--
  - (A) in paragraph (2), by striking `section 10004' and inserting `this part'; and
  - (B) in paragraph (3), by striking `the Settlement' and inserting `this part'; and
- (4) in subsection (d)--
  - (A) by inserting `, including without limitation, the costs of implementing subsections to sections 10004



~~10004~~(h)(4) of ~~this part~~section 10004,' after  
`implementing this part'; and  
(B) by striking `for implementation of the Settlement'.

## **SEC. ~~207537~~. COMPLIANCE WITH CENTRAL VALLEY PROJECT IMPROVEMENT ACT.**

Section 10007 of the San Joaquin River Restoration Settlement Act (Public Law 111-11; 123 Stat. 1354) is amended--

- (1) in the matter preceding paragraph (1),--
  - (A) by striking `the Settlement' and inserting `enactment of this part'; and
  - (B) by inserting: `and the obligations of the Secretary and all other parties to protect and keep in good condition any fish that may be planted or exist below Friant Dam, including any obligations under section 5937 of the California Fish and Game Code and the public trust doctrine, and those of the Secretary and all other parties under the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.).' before `, provided'; and
- (2) in paragraph (1), by striking `, as provided in the Settlement'.

## **SEC. ~~208538~~. NO PRIVATE RIGHT OF ACTION.**

Section 10008(a) of the San Joaquin River Restoration Settlement Act (Public Law 111-11; 123 Stat. 1355) is amended--

- (1) by striking `not a party to the Settlement'~~after `person or entity'~~; and
- (2) by striking `or the Settlement' ~~before the period~~ and inserting `unless otherwise provided by this part. ~~A, but any~~ Central Valley Project long-term water service or repayment contractor within the Friant Division, Hidden unit, or Buchanan Unit adversely affected by the ~~Secretary's failure~~failure of the Secretary to comply with section 10004(a)(3) ~~of this part~~ may bring an action against the Secretary for injunctive relief, ~~or~~ damages, or both.'.

## **SEC. ~~209539~~. IMPLEMENTATION.**

Section 10009 of the San Joaquin River Restoration Settlement Act (Public Law 111-11; 123 Stat. 1355) is amended--

- (1) in the header section heading by striking `; settlement fund';
- (2) in subsection (a)--
  - (A) in paragraph (1)--

(i) by striking `the Settlement' the first place it appears and inserting `this part';

(ii) by striking `, estimated to total' and all that follows through `subsection (b)(1),'; and

(iii) by striking `provided however,' and all that follows through `\$110,000,000 of State funds';

(B) in paragraph (2)--

(i) in subparagraph (A), by striking `(A) IN GENERAL- The Secretary' and inserting `The Secretary';  
and

(ii) by striking subparagraph (B); and

(C) in paragraph (3)--

(i) by striking `Except as provided in the Settlement, to' and inserting `To'; and

(ii) by striking `this Settlement' and inserting `this part';

(3) in subsection (b)(1)--

(A) by striking `In addition' and all that follows through `however, that the' and inserting `The';

(B) by striking `such additional appropriations only in amounts equal to'; and

(C) by striking `or the Settlement' before the period;

(4) in subsection (c)--

(A) in paragraph (1)--

(i) in the matter preceding subparagraph (A), by striking `the Settlement' and inserting `this part';

(ii) in subparagraph (C), by striking `from the sale of water pursuant to the Settlement, or'; and

(iii) in subparagraph (D), by striking `the Settlement' and inserting `this part';

(B) in paragraph (2), by striking `the Settlement and' before this part'; and

(5) by striking subsections (d) through (f).

## **SEC. ~~210540~~. REPAYMENT CONTRACTS AND ACCELERATION OF REPAYMENT OF CONSTRUCTION COSTS.**

Section 10010 of the San Joaquin River Restoration Settlement Act (Public Law 111-11;123 Stat. 1358) is amended--

(1) in subsection (a)--

(A) in paragraph (3)(D), by striking `the Settlement and' before `this part'; and

(B) in paragraph (4)(C), by striking `the Settlement and' before `this part';

in paragraphs (3)(D) and (4)(C) of subsection (a), by striking `the Settlement and' each place it appears;

(2) in subsection (c), by striking paragraph (3);

(3) in subsection (d)(1), by striking `the Settlement' in both each places it appears and inserting `this part';

(4) in subsection (e)--

(A) in paragraph (1)--

(i) by striking `Interim Flows or Restoration Flows, pursuant to paragraphs 13 or 15 of the Settlement' and inserting `Restoration Flows, pursuant to this part';

(ii) by striking `Interim Flows or' before `Restoration Flows'; and

(iii) by striking `the Interim Flows or Restoration Flows or is intended to otherwise facilitate the Water Management Goal, as described in the Settlement' and inserting `Restoration Flows'; and

(B) in paragraph (2)--

(i) by striking `except as provided in paragraph 16(b) of the Settlement' after `Friant Division long-term contractor'; and

(ii) by striking `the Interim Flows or Restoration Flows or to facilitate the Water Management Goal' and inserting `Restoration Flows'.

## **SEC. ~~211~~541. REPEAL.**

Section 10011 of the San Joaquin River Restoration Settlement Act (Public Law 111-11; 123 Stat. 1362) is repealed.

## **SEC. ~~212~~542. WATER SUPPLY MITIGATION.**

Section 10202(b) of the San Joaquin River Restoration Settlement Act (Public Law 111-11; 123 Stat. 1365) is amended--

(1) in paragraph (1), by striking `the Interim or Restoration Flows authorized in part I of this subtitle' and inserting `Restoration Flows authorized in this part';

(2) in paragraph (2), by striking `the Interim or Restoration Flows authorized in part I of this subtitle' and inserting `Restoration Flows authorized in this part'; and

(3) in paragraph (3)--

(A) in subparagraph (A), by striking `meet the Restoration Goal as described in part I of this subtitle' and inserting `recover Restoration Flows as described in this part';

- (B) in subparagraph (C)--
  - (i) by striking `the Interim or Restoration Flows authorized in part I of this subtitle' and inserting `Restoration Flows authorized in this part'; and
  - (ii) by striking `, and for ensuring appropriate adjustment in the recovered water account pursuant to section 10004(a)(5)'.

## **SEC. ~~213~~543. ADDITIONAL AUTHORITIES.**

Section 10203 of the San Joaquin River Restoration Settlement Act (Public Law 111-11; [123 Stat. 1367](#)) is amended--

- (1) in subsection (b)--
  - (A) by striking `section 10004(a)(4)' and inserting `section 10004(a)(3)'; and
  - (B) by striking `, provided' and all that follows through `section 10009(f)(2)'; and
- (2) by striking subsection (c).

## **~~TITLE III~~ Subtitle C--REPAYMENT CONTRACTS AND ACCELERATION OF REPAYMENT OF CONSTRUCTION COSTS**

## **SEC. ~~301~~551. REPAYMENT CONTRACTS AND ACCELERATION OF REPAYMENT OF CONSTRUCTION COSTS.**

(a) Conversion of Contracts.—

(1) Certain Contracts.—

~~(1)(A) In General.--~~ Not later than 1 year after the date enactment of this Act, the Secretary of the Interior, ~~upon the~~ request of the a contractor, shall convert all existing long-term Central Valley Project contracts entered into under ~~subsection 9(e) of section 9~~ of the Act of August 4, 1939 (53 Stat. 1196, chapter 418), to a contract under subsection 9(d) of section 9 of ~~said that~~ Act (53 Stat. 1195), under mutually agreeable terms and conditions.

~~(2) Upon request of the contractor, the Secretary is further authorized to convert, not later than 1 year after enactment, any Central Valley Project long-term contract entered under subsection (c)(2) of section 9 of the Act of August 4, 1939 (53 Stat. 1194), to a contract under subsection (c)(1) of section 9 of said Act, under mutually agreeable terms and conditions.~~

~~(3) All contracts entered into pursuant to paragraph (1) shall—~~  
—

(B) Restrictions.—A contract converted under subparagraph (A) shall--

~~(A)(i)~~ require the repayment, either in lump sum or by accelerated prepayment, of the remaining amount of construction costs identified in the most current version of the Central Valley Project Schedule of Irrigation Capital Allocations by Contractor, as adjusted to reflect payments not reflected in such-that schedule, and properly assignable for ultimate return by the contractor, not later than January 31, 2013, ~~(or if made in approximately equal annual installments, not later than January 31, 2016; such which amount to shall be discounted by the Treasury~~ Raterate (defined as the 20-year Constant Maturity Treasury rate published by the Department of the Treasury as of October 1, 2012); ~~An estimate of the remaining amount of construction costs as of January 31, 2013, as adjusted, shall be provided by the Secretary of the Interior to each contractor no later than 180 days after enactment;~~

~~(B)(ii)~~ require that, notwithstanding subsection (c)(2), construction costs or other capitalized costs incurred after the effective date of the converted contract or not reflected in the schedule referenced-described in subparagraph (A), clause (i), and properly assignable to such-that contractor, shall be repaid—

(I) in not more than 5 years after notification the date on which the contractor is notified of the allocation if such-that amount is a result of a collective annual allocation of capital costs to the contractors exercising contract conversions under this subsection of less than \$5,000,000; ~~or. If such amount is \$5,000,000 or greater, such cost shall be repaid as provided by applicable reclamation law, provided that the reference to the amount of \$5,000,000 shall not be a precedent in any other context; and~~

(II) if the allocation of capital costs described in subclause (I) equal \$5,000,000 or more, as provided by applicable reclamation law, subject to the condition that the reference to the amount of \$5,000,000 shall not be a precedent in any other context; and

~~(C)(iii)~~ provide that power revenues will not be available to aid in repayment of construction costs allocated to irrigation under the contract.

(C) Estimate.—Not later than 180 days after the date of enactment of this Act, the Secretary of the Interior shall provide to each contractor an estimate of the remaining amount of construction costs under subparagraph (B)(i) as of January 31, 2013, as adjusted.

(2) Other Contracts.—

(A) In General.—Not later than 1 year after the date of enactment of this Act, on the request of the contractor, the Secretary may convert any Central Valley Project long-term contract entered into under section 9(c)(2) of the Act of August 4, 1939 (chapter 418; 53 Stat. 1194) to a contract under section 9(c)(1) of that Act, under mutually agreeable terms and conditions.

~~(4) All contracts entered into pursuant to paragraph (2) shall—~~

(B) Restrictions.—A contract converted under subparagraph (A) shall—

~~(A)(i) require the repayment in lump sum of the remaining amount of construction costs identified in the most current version of the Central Valley Project Schedule of Municipal and Industrial Water Rates, as adjusted to reflect payments not reflected in such that schedule, and properly assignable for ultimate return by the contractor, not later than January 31, 2016.; and An estimate of the remaining amount of construction costs as of January 31, 2016, as adjusted, shall be provided by the Secretary of the Interior to each contractor no later than 180 days after enactment; and~~

~~(B)(ii) require that, notwithstanding subsection (c)(2), construction costs or other capitalized costs incurred after the effective date of the contract or not reflected in the schedule referenced described in subparagraph (A), clause (i), and properly assignable to such that contractor, shall be repaid—~~

~~(I) in not more than 5 years after notification the date on which the contractor is notified of the allocation if such the amount is a result of a collective annual allocation of capital costs to the contractors exercising contract conversions under this subsection of less than \$5,000,000.;~~

~~(II) If such amount is if the allocation of capital costs described in subclause (I) equal \$5,000,000 or greater, such cost shall be repaid more, as provided by applicable reclamation law, provided subject to the condition that the reference to the amount of~~

\$5,000,000 shall not be a precedent in any other context.

(C) Estimate.—Not later than 180 days after the date of enactment of this Act, the Secretary of the Interior shall provide to each contractor an estimate of the remaining amount of construction costs under subparagraph (B)(i) as of January 31, 2016, as adjusted.

(b) Final Adjustment.—

(1) In General.—The amounts paid pursuant to subsection (a) shall be subject to adjustment following a final cost allocation by the Secretary of the Interior upon completion of the construction of the Central Valley Project.

(2) Repayment Obligation.—

(A) In General.—~~In the event that the~~If final cost allocation indicates that the costs properly assignable to the contractor are greater than ~~what the amount that~~ has been paid by the contractor, the contractor shall ~~be obligated to~~ pay the remaining allocated costs.

(B) Terms.— The term of ~~such an~~ additional repayment contract described in subparagraph (A) shall be-- shall be

(i) for not less than 1 year and not more than 10 years; and

(ii) however, based on mutually agreeable provisions regarding the rate of repayment of ~~such the amount may be~~ developed by the parties.

(3) Credits.—~~In the event that~~If the final cost allocation indicates that the costs properly assignable to the contractor are less than ~~what the amount that~~ the contractor has paid, the Secretary of the Interior ~~is authorized and directed to credit such~~ shall credit the amount of the overpayment as an offset against any outstanding or future obligation of the contractor.

(c) Applicability of Certain Provisions.—

(1) In General.— Notwithstanding any repayment obligation under subsection ~~(a)(3)(B)~~ (a)(1)(B)(ii) or subsection (b), ~~upon a contractor's compliance~~ the compliance of a contractor with and discharge of the obligation of repayment of the construction costs ~~as provided in~~ under that subsection ~~(a)(3)(A)~~, the ownership and full-cost pricing limitations of any provision of Federal reclamation laws s shall not apply to lands ~~in such in that~~ district.

(2) Other Contracts.— Notwithstanding any repayment obligation under paragraph ~~(3)(B)(1)(B)(ii)~~ or ~~paragraph (4)(B)(2)(B)(ii)~~ of subsection (a), or subsection (b), ~~upon a~~



~~contractor's compliance~~ on the compliance of a contractor with and discharge of the obligation of repayment of the construction costs ~~as provided in paragraphs (3)(A) and (4)(A) of under that subsection (a), such the~~ contractor shall continue to pay applicable operation and maintenance costs and other charges applicable to ~~such the~~ repayment contracts pursuant to ~~the~~ then-current rate-setting policy and applicable law.

(d) Certain Repayment Obligations Not Altered. —This section does not—

~~Implementation of the provisions of this section shall not~~

(1) alter the repayment obligation of any other long-term water service or repayment contractor receiving water from the Central Valley Project; or

(2) shift any costs that would otherwise have been properly assignable to any contractors absent this section, including operations and maintenance costs, construction costs, or other capitalized costs incurred after the date of enactment of this Act, to other ~~such~~ contractors.

(e) Statutory Interpretation. -- Nothing in this ~~part shall be construed to affect subtitle affects~~ the right of any long-term contractor to use a particular type of financing to make the payments required in paragraph ~~(3)(A)(1)(B)(i) or paragraph (4)(A)(2)(B)(i)~~ of subsection (a).

~~(f) Definition of Treasury Rate—For purposes of this section, 'Treasury Rate' shall be defined as the 20-year Constant Maturity Treasury rate published by the United States Department of the Treasury as of October 1, 2012.~~

## **~~TITLE IV~~ Subtitle D--BAY-DELTA WATERSHED WATER RIGHTS PRESERVATION AND PROTECTION**

### **SEC. ~~401561~~ 561. WATER RIGHTS AND AREA-OF-ORIGIN PROTECTIONS.**

Notwithstanding the provisions of this ~~Act~~ title, Federal reclamation law, or the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.)--

(1) the Secretary of the Interior ~~(`Secretary') is directed~~ shall, in the operation of the Central Valley Project, ~~to--~~

(A) strictly adhere to State water rights law governing water rights priorities by honoring water rights senior to those belonging to the Central Valley Project, regardless of the source of priority; and

~~(2) the Secretary is directed, in the operation of the Central Valley Project, to (B)~~ strictly adhere to and honor water



rights and other priorities that are obtained or exist pursuant to ~~the provision~~the of California Water Code, including sections 10505, 10505:5, 11128, 11460, and 11463; and ~~sections 12200 to 12220, inclusive~~; and ~~(3)~~(2) any action that affects the diversion of water or involves the release of water from any Central Valley Project water storage facility taken by the Secretary of the Interior or the Secretary ~~of the Department~~ of Commerce to conserve, enhance, recover, or otherwise protect any species listed under the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) shall be applied in a manner that is consistent with water right priorities established by State law.

## **SEC. ~~402~~562. SACRAMENTO RIVER SETTLEMENT CONTRACTS.**

(a) In General.--In ~~the implementation of~~carrying out the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.), in the Bay-Delta and on the Sacramento River, the Secretary of the Interior and the Secretary of Commerce ~~are directed to~~shall apply any limitations on the operation of the Central Valley Project or ~~to formulate~~relating to the formulation of any 'reasonable prudent alternative' associated with the operation of the Central Valley Project in a manner that strictly adheres to and applies the water rights priorities for 'Project Water'project water and 'Base Supply'base supply as provided ~~for~~ in the Sacramento River Settlement Contracts.

(b) Applicability.-- Article 3(i) of the Sacramento River Settlement Contracts shall not be ~~utilized by the United States~~used by the Secretary of the Interior or any other Federal agency head as means to provide shortages ~~to the Sacramento River Settlement Contracts~~ that are different than those provided for in Article 5(a) of ~~those contracts~~the Sacramento River Settlement Contracts.

## **SEC. ~~403~~563. SACRAMENTO RIVER WATERSHED WATER SERVICE CONTRACTORS.**

(1)(a) Existing Central Valley Project Agricultural Water Service Contractors Within Sacramento River Watershed.--In this section, ~~The~~ the term 'existing Central Valley Project agricultural water service contractors within the Sacramento River Watershed' means water service contractors within the Shasta, Trinity, and Sacramento River Divisions of the Central Valley Project, that have a water service contract in effect, on the date of ~~the~~ enactment of this ~~section~~Act, that provides water for irrigation.

~~(a) In General-~~(b) Allocation of Water.-- Subject to subsection ~~(b)~~(c) and the absolute priority of the Sacramento River Settlement

Contractors to Sacramento River supplies over Central Valley Project diversions and deliveries to other contractors, the Secretary of the Interior is directed shall, in the operation of the Central Valley Project, ~~to~~ allocate water provided for irrigation purposes to existing Central Valley Project agricultural water service contractors within the Sacramento River Watershed ~~in compliance with the following~~ as follows:

(1) Not less than 100% percent of their contract quantities in a 'Wet' year (as that term is defined in the Sacramento Valley Water Year Type (40-30-30) Index).

(2) Not less than 100% percent of their contract quantities in an 'Above Normal' year (as that term is defined in the Sacramento Valley Water Year Type (40-30-30) Index).

(3) Not less than 100% percent of their contract quantities in a 'Below Normal' year (as that term is defined in the Sacramento Valley Water Year Type (40-30-30) Index).

(4) Not less than 75% percent of their contract quantities in a 'Dry' year (as that term is defined in the Sacramento Valley Water Year Type (40-30-30) Index).

(5) Not less than 50% percent of their contract quantities in a 'Critically Dry' year (as that term is defined in the Sacramento Valley Water year Type (40-30-30) Index).

~~(b)~~ (c) Protection of Municipal and Industrial Supplies.—

(1) In General.-- Nothing in ~~subsection~~ this section—

~~(a) shall be deemed to (i)~~ (A) modify any provision of a water service contract that addresses municipal and industrial water shortage policies of the Secretary of the Interior;

~~(ii) (B) affects~~ or limits the authority of the Secretary of the Interior

(i) to adopt or modify municipal and industrial water shortage policies; or

~~(iii) affect or limit the authority of the Secretary (ii)~~ to implement municipal and industrial water shortage policies; or

~~(iv) (C) affects~~ allocations to Central Valley Project municipal and industrial contractors pursuant to ~~such the water shortage policies of the Secretary of the Interior~~. Neither subsection (a) nor the Secretary's implementation of subsection

~~(a)~~ (2) Applicability.— This section ~~shall~~ does not constrain, govern, or affect, directly or indirectly, the operations of the Central Valley Project's American River Division of the Central Valley Project or any deliveries from that Division, ~~its including the units or its~~ and facilities of that Division.

~~(c) Definitions—~~ In this section:

~~(1) The term 'existing Central Valley Project agricultural water service contractors within the Sacramento River Watershed' means water service contractors within the Shasta, Trinity, and Sacramento River Divisions of the Central Valley Project, that have a water service contract in effect, on the date of the enactment of this section, that provides water for irrigation.~~  
~~(2) The year type terms used in subsection (a) have the meaning given those year types in the Sacramento Valley Water Year Type (40 30 30) Index.~~

## **SEC. ~~404~~564. NO REDIRECTED ADVERSE IMPACTS.**

The Secretary of the Interior shall ~~insure~~ ensure that there are no redirected adverse water supply or fiscal impacts to the State Water Project or to individuals ~~those~~ within the Sacramento River or San Joaquin River watershed ~~or to the State Water Project~~ arising from the ~~Secretary's operation~~ operation of the Secretary of the Central Valley Project to meet legal obligations imposed by or through any ~~State or Federal~~ Federal or State agency, including,--

~~(1) but not limited to those legal obligations emanating from~~ the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) ~~or this Act,~~  
~~or;~~

~~(2) this title; and~~

~~(3) actions or activities implemented to meet the twin goals of improving water supply or and addressing~~ the environmental needs of the Bay Delta.

## **~~TITLE V~~SUBTITLE E--MISCELLANEOUS**

## **SEC. ~~501~~571. PRECEDENT.**

Congress finds ~~and declares~~ that--

(1) coordinated operations between the Central Valley Project and the State Water Project, ~~previously requested and as~~ consented to and requested by the State of California and the Federal Government, require assertion of Federal supremacy to protect existing water rights throughout the system; ~~and (2) these circumstances are unique to California.~~ a circumstance that is unique to the State of California; and

~~(2) Therefore, nothing in this Act shall~~ this title should not serve as precedent for similar operations in any other State.

Passed the House of Representatives February 29, 2012.

Attest:

KAREN L. HAAS,

Clerk.

Calendar No. 332



**From:** Jason Peltier

**Sent:** Friday, May 18, 2012 7:39 AM

**To:** Joe Findaro; David Bernhardt; Tony Coelho; Ed Manning; Carolyn Jensen (cjensen@ka-pow. com); Ara.azhderian@sldmwa.org

**Subject:** FW: Denham response to Geo Miller

**Attachments:** 5-17-12 Letter to Rep Miller (Water).pdf

---

**From:** Larrabee, Jason [mailto:Jason.Larrabee@mail.house.gov]

**Sent:** Friday, May 18, 2012 7:22 AM

**To:** 'Jason Peltier'

**Subject:** FW: Denham response to Geo Miller

I included myself instead of you. Sorry about that.

---

**From:** Larrabee, Jason

**Sent:** Friday, May 18, 2012 10:21 AM

**To:** 'Tim O'Laughlin'; Larrabee, Jason; Tom Birmingham ([tbirmingham@westlandswater.org](mailto:tbirmingham@westlandswater.org)); 'Dan Nelson'; 'Steve Chedester'

**Subject:** Denham response to Geo Miller

FYI... Jeff hand delivered the letter to Miller yesterday on the floor. We're not trying to make this a media story like Miller did, but wanted you to have the final version of Jeff's response. Please let me know if you have any questions.

**Jason Larrabee**

**Chief of Staff**

**Rep. Jeff Denham (CA-19)**

**(202) 225-4540 - office**

**(530) 570-1620 - cell \*\*pls note new #\*\***

Please sign up for Rep Denham's e-newsletter at <http://denham.house.gov/contact-me/newsletter>

**Congress of the United States**  
**House of Representatives**  
**Washington, DC**

May 17, 2012

The Hon. George Miller  
2205 Rayburn House Office Building  
Washington, DC 20515

Dear Congressman Miller:

I applaud your desire to ensure facts are stated when public comments are made about water policy in California. Unfortunately, your attempt to politicize my press release by sending your letter to me via the media shows how little you actually care about facts and more about your desire to spread falsehoods to divide the water community further.

First, my statement that Central Valley Project (CVP) contractors "...pay the full cost of a 100% allocation of water..." is factual. The Reclamation Project Act of 1939 requires the Secretary of the Interior to establish water rates for the sale of water to "produce revenue at least sufficient to cover annual operations and maintenance (O&M) costs and the appropriate share of fixed charges (construction costs) of the project." Establishment of the water rates is guided by the CVP Irrigation Ratesetting Policy (Policy) approved in 1988. The Policy will recover the United States' investment by the year 2030, as required by Section 105 of Public Law 99-546. To achieve this, the Policy provides for the automatic adjustment of water rates on an annual basis, also in accordance with Section 105 of Public Law 99-546. Lastly, in order to ensure repayment accountability, Reclamation tracks the repayment obligations of each contractor individually, including any interest bearing operation and maintenance deficits incurred, as required by Section 106 of Public Law 99-546.

The net effect of this complex and intensive accounting effort is that as water deliveries diminish, water rates increase. Your statement that Section 3405(d)(4) of Public Law 102-575 prevents contractors from paying the full cost because, "the Secretary shall charge contractors only for water actually delivered" ignores the fact that the water rate changes. Central Valley Project Irrigation and Municipal & Industrial water contract holders (Contractors) pay 100% of reimbursable costs for O&M of the CVP on an annual basis regardless of actual deliveries. When insufficient acre-feet are provided by the CVP to cover the O&M costs (e.g. receiving less than a full contract amount), the remaining O&M balance is rolled into an *interest-bearing* account that accrues interest during each of the following years until the balance owed is repaid in full. You either fail to understand CVP financials or seek to confuse the public that CVP Contractors somehow aren't responsible for all reimbursable costs regardless of revenues collected during a given year. As an example, in high allocation years, revenues typically exceed

The Hon. George Miller  
May 17, 2012  
Page 2

reimbursable costs; conversely, in low allocation years, costs typically exceed revenues and *interest-bearing* O&M deficits are generated. This is why providing 100% delivery of contract amounts is critical for not only valuable food, fiber and job creation, but also prudent financial management of the CVP.

Second, the law you're so proud of, the Central Valley Project Improvement Act (CVPIA), required that all of its implementation costs, its capital costs and O&M, be repaid in full by 2030. The Mid-Pacific Region of the Bureau of Reclamation (Reclamation) has informed Contractors that if the cumulative reimbursable share of CVPIA expenses ever exceeds cumulative Contractor payments through the Restoration fund, then the difference will be billed to Contractors through their water and power rates. Again, the CVP Contractors are responsible for all reimbursable CVPIA expenses regardless of the total amount of acre-feet delivered in any given year. Did these facts and provisions of the CVPIA somehow slip your mind or is this your attempt to obfuscate the issues further?

Third, the only CVP Contractors who do not pay *interest* on the capital costs (not to be confused with the *interest* paid on O&M) of the CVP are those who either are in a Reclamation determined "inability to pay" status or those that exceed acreage limitations determined by the Reclamation Reform Act of 1982 (RRA). Those who exceed the RRA limits automatically pay interest on the capital costs. Your halfhearted plea for protecting the taxpayer would be better founded if your concern over spending was consistent with your federally funded water conservation and recycling projects in the Bay Area which receive Reclamation grants with no interest payment requirement, and as a matter of fact, no requirement of repayment ever. I remind you, as a requirement under Section 105 of Public Law 99-546, the CVP must be paid off in full by 2030. Another way for you to save taxpayer money could be to propose a bill to decrease the massive subsidy the Bay Area currently receives to drown portions of Yosemite National Park with the Hetch Hetchy Reservoir.

It is truly unfortunate that you either tried to purposely confuse the public and create issues that do not exist or that maybe you simply tried to direct attention away from your failed water policy, the CVPIA. As a part of the CVPIA, you seem to have forgotten the requirement to replace the 800,000 acre-feet of water lost by CVP Contractors. Were you too busy in the twenty years since the CVPIA was signed into law to focus on correctly implementing your law?

At a minimum, you have chosen to politicize these issues further by sending a press release on member to member communications instead of talking to me personally. I suppose with the CVPIA's twenty-year track record of – having more threatened and endangered species listed, not less; causing less reliable deliveries of water, not more; putting many families out of work, especially those of limited means, instead of growing the bread basket of the world and creating long term job stability; costing taxpayers and CVP rate payers hundreds of millions of dollars; and, creating an operational regime of the CVP to only be able to deliver a 40% allocation of



The Hon. George Miller  
May 17, 2012  
Page 3

water when nearly every CVP reservoir is at or near capacity this year – I can see how you would want to create red herrings and cast blame on others instead of discussing the facts. Even a March 22, 2012 letter from the Golden Gate Salmon Association to Reclamation and the U.S. Fish and Wildlife Service highlights serious concerns about the CVPIA and the Restoration work plan. They go so far as to state in their letters of both 2011 and 2012, **“We do not believe the Restoration Plan in its current mode of operation has a prayer of doubling or even restoring the salmon populations.”** After twenty years and nearly a billion dollars in expenditures, I can see why you would want the public to focus on something else other than the record of destruction and failure brought by the CVPIA.

Lastly, keep in mind legislation I’ve introduced and amendments to various water measures I’ve proposed are commonsense proposals to streamline projects and authorize construction of new water storage projects, including the expansion of Los Vaqueros Reservoir, that actually create the 800,000 acre-feet of CVP water supply you have forgotten about. I would hope you would have an open mind on these provisions and support additional storage in your own back yard, especially since your Contra Costa County constituents rely on water exported from the Delta at their own pumping plant in a similar fashion as other Contractors. In the end, you can rest assured I will continue to work with anyone interested in providing solutions to our water issues and not simply throw around blame for no purpose other than to cover up your own legislation’s failed outcome. I hope you will join me in creating much needed jobs in California and put an end to the rhetoric that has stifled our water supplies for decades.

Sincerely,



JEFF DENHAM  
U.S. Representative

**From:** Jason Peltier

**Sent:** Friday, May 18, 2012 12:11 PM

**To:** Joe Findaro; David Bernhardt; Tom Birmingham; Tony Coelho; Ed Manning; Carolyn Jensen (cjensen@ka-pow.com)

**Subject:** Fwd: Jerry Brown

Begin forwarded message:

**From:** Mike Henry <[mhenry@farmwater.org](mailto:mhenry@farmwater.org)>

**Date:** May 18, 2012 10:40:57 AM PDT

**To:** Mike Wade <[mwade@farmwater.org](mailto:mwade@farmwater.org)>, Ara Azhderian <[Aazhderian@sldmwa.org](mailto:Aazhderian@sldmwa.org)>, Jason Peltier <[jpeltier@westlandswater.org](mailto:jpeltier@westlandswater.org)>, "Gayle Holman, Public Affairs Rep at Westlands Water District" <[gholman@westlandswater.org](mailto:gholman@westlandswater.org)>

**Subject:** Jerry Brown

**May 18, 2012**

Sacramento Bee

Jerry Brown defends California, pegs water project at \$14 billion

<<http://blogs.sacbee.com/capitolalertlatest/2012/05/jerry-brown-defends-california-pegs-water-project-at-14-billion.html>>

Gov. **Jerry Brown** said in an interview televised this morning that the water project he proposes this year will be a \$14 billion endeavor.

The Democratic governor's remark suggests the administration is fine-tuning its proposal for a peripheral canal or other way to move water through or around the Delta, even as a public announcement has been delayed. In January, Brown said the project would cost water users "well over \$10 billion."

Brown was on "CBS This Morning" to promote his November ballot initiative to raise taxes and to defend the budget he revised on Monday. The state budget deficit has grown to \$15.7 billion from the \$9.2 billion Brown estimated in January.

"California is growing," Brown said in an interview taped Thursday. "This is not Europe ... We're very entrepreneurial, very innovative, and people are still coming here. You know, this is where they put in, they invented Facebook. Not in Texas, not in Arizona. Not in Manhattan, and certainly not under the, you know, the White House or the Congress. This is still the Wild West, <<http://topics.sacbee.com/Wild+West/>> and we're going to prove to the rest of this country and the world that we know how to do it."

Told by CBS' **Charlie Rose** that Facebook was invented in Cambridge, Mass., Brown said that after tinkering there, "they learned fast to get on a plane and get out to California, where all the other innovative people are."

Brown's comments about the water project came as he defended another multi-billion infrastructure project: high-speed rail.

"California's not stopping," Brown said. "We're not some tired country of Europe. We're a buoyant, dynamic society that will both discipline itself on a daily basis, but it will, on the long term, plant the seeds of future

growth."

Read more here: <http://blogs.sacbee.com/capitolalertlatest/2012/05/jerry-brown-defends-california-pegs-water-project-at-14-billion.html#storylink=cpy>

**Mike Henry, Assistant Executive Director**

**California Farm Water Coalition**

6133 Freeport Blvd.

2nd Floor

Sacramento, CA 95822

(916) 391-5030

[www.farmwater.org](http://www.farmwater.org)

**From:** Carolyn Jensen  
**Sent:** Friday, May 18, 2012 12:19 PM  
**To:** 'jpeltier@westlandswater.org'; 'joe.findaro@akerman.com'; 'dbernhardt@bhfs.com'; 'tbirmingham@westlandswater.org'; 'tony@onewharf.com'; Ed Manning  
**Subject:** Re: Fwd: Jerry Brown

The Gov's comments on water are "top of the news" on KMJ radio.

---

**From:** Jason Peltier [mailto:jpeltier@westlandswater.org]  
**Sent:** Friday, May 18, 2012 12:11 PM  
**To:** Joe Findaro <joe.findaro@akerman.com>; David Bernhardt <DBernhardt@BHFS.com>; Tom Birmingham <tbirmingham@westlandswater.org>; Tony Coelho <tony@onewharf.com>; Ed Manning; Carolyn Jensen  
**Subject:** Fwd: Jerry Brown

Begin forwarded message:

**From:** Mike Henry <[mhenry@farmwater.org](mailto:mhenry@farmwater.org)>  
**Date:** May 18, 2012 10:40:57 AM PDT  
**To:** Mike Wade <[mwade@farmwater.org](mailto:mwade@farmwater.org)>, Ara Azhderian <[Aazhderian@sldmwa.org](mailto:Aazhderian@sldmwa.org)>, Jason Peltier <[jpeltier@westlandswater.org](mailto:jpeltier@westlandswater.org)>, "Gayle Holman, Public Affairs Rep at Westlands Water District" <[gholman@westlandswater.org](mailto:gholman@westlandswater.org)>  
**Subject:** Jerry Brown

**May 18, 2012**  
Sacramento Bee

Jerry Brown defends California, pegs water project at \$14 billion  
<<http://blogs.sacbee.com/capitolalert/latest/2012/05/jerry-brown-defends-california-pegs-water-project-at-14-billion.html>>

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**Mike Henry, Assistant Executive Director**

**California Farm Water Coalition**

6133 Freeport Blvd.

2nd Floor

Sacramento, CA 95822

(916) 391-5030

[www.farmwater.org](http://www.farmwater.org)

**From:** Jason Peltier

**Sent:** Thursday, May 24, 2012 7:07 AM

**To:** T Birmingham; Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLoyd Fryer; 'Martin McIntyre'; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** FW: Delta Smelt Habitat Paper Submitted

**Attachments:** Sommer Delta Smelt Habitat Paper Submitted 5 2012.pdf

---

**From:** Jerry Meral [mailto:jerry.meral@resources.ca.gov]

**Sent:** Wednesday, May 23, 2012 7:52 PM

**To:** King Moon, Laura; rpatterson@mwdh2o.com; jpeltier@westlandswater.org

**Cc:** Karla Nemeth; Carl Wilcox

**Subject:** FW: Delta Smelt Habitat Paper Submitted

I think this will help with our habitat efforts.

Jerry

---

**From:** Sommer, Ted [mailto:tsommer@water.ca.gov]

**Sent:** Monday, May 21, 2012 10:23 AM

**To:** Jerry Meral

**Cc:** Messer, Dean F.; Spaar, Stephani; McEwan, Dennis

**Subject:** Delta Smelt Habitat Paper Submitted

Jerry,

Thanks for your patience on the delta smelt habitat white paper. I wanted to let you know that I submitted the attached paper today to the journal San Francisco Estuary and Watershed Science. I was able to take advantage of quiet BDCP week (i.e. no long reviews), plus I finally got the material I needed from my co-author, who left DWR this fall to go back to grad school.

Note that I had already provided copies of the last draft to the BDCP consultants, who incorporated some of the information into their analyses.

Don't hesitate to let me know if you have any questions.

Regards,

Ted Sommer, PhD

Program Manager II

California Department of Water Resources

3500 Industrial Blvd

West Sacramento CA 95691-6521

Mailing Address: PO Box 942836

Sacramento CA 94236-0001

Tel: 916-376-9772



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**A Place To Call Home:**  
**A Synthesis of Delta Smelt Habitat in the Upper San Francisco Estuary**

Ted Sommer and Francine Mejia  
*California Department of Water Resources, Division of Environmental Services, P.O.*  
*Box 942836, Sacramento, CA 94236-0001, USA*

Corresponding Author: [tsommer@water.ca.gov](mailto:tsommer@water.ca.gov)



*Abstract.* We used a combination of published literature and field survey data to synthesize the available information about delta smelt *Hypomesus transpacificus*, a declining native species in the San Francisco estuary. Delta smelt habitat ranges from San Pablo and Suisun bays to their freshwater tributaries, including Delta and the Sacramento and San Joaquin rivers. In recent years, substantial numbers have colonized habitat in Liberty Island, a north Delta area which flooded in 1997. The species has more upstream distribution during spawning periods and a more downstream distribution during wetter years. Delta smelt are most common in low salinity habitat (<6 psu) with high turbidities (>12 ntu) and moderate temperatures (7-25°C). They do not appear to have strong substrate preferences, but sandy shoals may be important for spawning. The evidence to date suggests that they generally require at least moderately tidal habitats. Delta smelt also occur in a wide range of channel sizes, although they seem to be rarer in small channels (<15 m wide). Nonetheless, there is some evidence that open water habitat adjacent to long residence time areas (e.g. tidal marsh, shoal, low order channels) may be favorable. Other desirable features of delta smelt habitat include high calanoid copepod densities, and low levels of submerged aquatic vegetation and the toxic algae *Microcystis*. While enough is known to plan for large scale pilot habitat projects, these efforts are vulnerable to several factors, most notably climate change, which will change salinity regimes and increase the occurrence of lethal temperatures. We recommend a “bet hedging” approach coupled with extensive monitoring and adaptive management. An overall emphasis on ecological processes rather than specific habitat features is also likely to be most effective.

## Introduction

The San Francisco Estuary is one of the prominent features of the California coastline. The estuary is both unconventional and complex, supporting diverse habitats ranging from marine bays to brackish marshes and tidal freshwater wetlands. Given the extreme level of urbanization and hydrologic alteration of the estuary, it is therefore not surprising that identifying and protecting the habitats of endemic plants and animals has become one of the major resource management issues in the San Francisco Estuary (Figure 1). Habitat increasingly has become a target of management and restoration as a result of declines in multiple trophic levels. Of the various declines, the highest-profile has been the collapse of the pelagic fish community of the upper San Francisco estuary (Sommer and others 2007). Indeed, few regional fisheries issues have generated as much debate as the habitat requirements of delta smelt *Hypomesus transpacificus*, a native osmerid that occurs only in the low salinity zone of the system. The population has declined precipitously over the past decade, leading to major legal and regulatory actions to try and improve its status (Service 2007; Sommer and others 2007). The species is currently listed as Threatened under the Federal Endangered Species Act and Endangered under the California Endangered Species Act (USFWS 2008).

This annual species is confined to a single estuary, so maintenance of the population depends in part on habitat conditions in the Sacramento-San Joaquin Delta (herein referred to as the *Delta*), the upstream region of the San Francisco Estuary from which the species gets its name (Figure 1). The hydrodynamics of the Delta's highly interconnected channels are especially complex and highly altered, with major changes to

key parts of the distribution of delta smelt. One of the biggest hydrologic changes over the past century has been the construction of the large Central Valley Project (CVP) and State Water Project (SWP) water diversions, which supply water to about 25 million California residents and a multi-billion dollar agricultural industry (Grimaldo and others 2009).

Given its legal status, there has been substantial progress in understanding the life history of this species (Moyle and others 1992; Bennett 2005; Nobriga and Herbold 2009). The typical pattern is for delta smelt to inhabit the oligohaline to freshwater portion of the estuary for much of the year until late winter and early spring, when they migrate upstream to spawn (Sommer and others 2011a). Following hatching, their young subsequently migrate downstream in spring towards the brackish portion of the estuary (Dege and Brown 2004). Some of the key physiological and environmental requirements are understood based on laboratory studies and analyses of field data (Swanson and others 1998, 2000; Baskerville-Bridges and others 2004; Feyrer and others 2007; Nobriga and others 2008).

The primary objective of this paper was to synthesize the available information about the habitat of delta smelt and to provide insight into what may happen in the future. Although there are multiple definitions of habitat, we have chosen to consider delta smelt habitat as the physical, chemical, and biological factors in the aquatic environment of this species (Hayes and others 1996). Moreover, we assume that the maintenance of appropriate habitat quality is essential to the long-term health of delta smelt (Rose 2000; Peterson 2003). We emphasize that this does not mean that this report assumes that habitat is the primary driver of the delta smelt population. To the contrary, there is

91 substantial evidence that delta smelt are controlled by a complex set of multiple  
92 interacting factors (Sommer and others 2007; Baxter and others 2010; MacNally and  
93 others 2010). Therefore, it should not be assumed that providing good habitat conditions  
94 now or in the future will guarantee delta smelt success. In ecological terms, this issue is  
95 often considered in terms of the *realized* versus *fundamental* niche of a species. Having  
96 lots of suitable habitat creates the potential for delta smelt to occupy a large area (i.e.  
97 *fundamental niche*), but the *realized* distribution may be much smaller because other  
98 factors (e.g. predators) limit their ability to use all of the available area. In other words,  
99 habitat is a necessary but not sufficient condition to support delta smelt. Habitat is,  
100 nonetheless, unique in that it not only directly affects the species of interest (delta smelt),  
101 but all affects other population drivers including “top-down” and “bottom-up” effects.  
102 As such, it provides an excellent useful starting point for evaluating the ecological status  
103 of species and potential restoration options.

104 A key point in evaluating delta smelt habitat is that it needs to be considered in two  
105 different ways. First, it can be considered in a geographical context based on fixed  
106 regions of the delta that seem to be important for delta smelt such as the west Delta,  
107 Suisun Bay, and Cache Slough Complex. Because the estuary is strongly tidal and delta  
108 smelt are a pelagic fish strongly associated with distinct salinity ranges (Dege and Brown  
109 2004; Feyrer and others 2007; Kimmerer and others 2009), its habitat must also be  
110 considered as constantly shifting in position along the axis of the estuary. In physical  
111 science terms, the former is the Eulerian frame of reference, while the later is the  
112 Lagrangian frame of reference.

For the purposes of this study, we focused on the following major questions: 1) what are the basic physical, chemical, and biological requirements for delta smelt habitat? 2) What geographic areas currently provide these conditions? 3) What habitat types support delta smelt? 4) Given factors such as climate change, will the upper estuary provide suitable conditions in the future? With respect to the last question, a second major objective of the study was to identify which areas and habitat features will improve the survival chances of delta smelt. Hence, our analysis was clearly targeted at providing direction for large scale restoration efforts being considered under programs such as the Bay Delta Conservation Plan (BDCP) and recent Biological Opinions (FWS 2008).

Because of the limited nature of the data available on delta smelt, our study was not intended as a “bible” for their habitat. Specifically, our synthesis does not provide detailed description of what delta smelt require for any single factor, habitat, or geographic area. Moreover, we focus on the direct habitat needs of delta smelt, but do not substantially address the role of subsidies across habitats that this fish do not necessarily occupy (e.g. tule marsh contributions to the smelt food web). Our goal was therefore to provide a basis for generating testable hypotheses for future restoration and research projects. Given the rarity of delta smelt and associated constraints on field collection, we also hoped that our analyses of existing data would help to set priorities for future studies.

## **Methods and Materials**

Assessing habitat needs of delta smelt is especially challenging because the fish is very small (usually <100 mm FL), fragile, increasingly rare, and has a protected legal status (Moyle 2002; Bennett 2005). A related issue is that the San Francisco estuary is vast and spatially complex, with multiple tributaries, embayments, and braided channels (Figure 1). High turbidity levels in the estuary present major challenges to direct observations of habitat use. As noted previously, the need to evaluate smelt habitat in both Lagrangian (moving flow field) and Eulerian (fixed locations) frames of references complicates the interpretation of the available data. Finally, observational data on different habitats can yield ambiguous or even misleading results. For example, juvenile Chinook salmon densities are consistently higher along the narrow rip-rapped edge of the Sacramento River than in the broad expanses of the adjacent Yolo Bypass floodplain (Ted Sommer, California Department of Water Resources, unpublished data). In other words, care must be used to correct observational data for habitat availability.

Several of these issues meant that currently it is not feasible to use traditional habitat assessment techniques such as telemetry, mark-recapture, or visual observation. We therefore relied on a combination of published literature, data analyses from long- and short-term fisheries surveys, and the expert opinion of colleagues to synthesize the available information with delta smelt. There is no question that our approach has a higher uncertainty than direct observational methods; however, the information represents the best available given the many constraints. Although our synthesis does not follow the format of a traditional scientific paper, similar efforts to integrate multiple information sources have proven useful to guide subsequent research and restoration (e.g. Moyle and others 2004).

## *Data Sources*

*Literature:* We focused on peer-reviewed literature, the majority of which was from the San Francisco estuary and about delta smelt. For topics with no journal publications, we also included some agency reports and unpublished manuscripts.

*Long-term surveys:* The following describes several of the key Interagency Ecological Program monitoring surveys that collect delta smelt. Several of the descriptions are from Sommer and others (2011a) and are presented approximately in ontogenetic order starting with larvae.

Initiated in 1995, the California Department of Fish and Game (DFG) 20 mm survey typically samples larvae during each neap tide between March and July (Dege and Brown 2004). A total of 48 sites have been sampled continuously and include freshwater to mesohaline habitats of the estuary. Three 10-min oblique tows are conducted at each location using a 5.1-m long, skid mounted net with a 1.5 m<sup>2</sup> mouth, a 1.6 mm mesh body and a removable 2.2 L cod end jar. Zooplankton tows were collected simultaneously using a Clarke-Bumpus net (0.160 mm mesh nylon cloth, outer mouth diameter of 12.5 cm, 76 cm length with a cod-end screened with 0.140 mm mesh) Volume was recorded with a General Oceanics model 2030 flow meter. Zooplankton samples were preserved in 10% formalin with Rose Bengal dye. Preserved samples were concentrated in the laboratory by pouring them through a sieve screened with 0.154 mm mesh wire, rinsed, then reconstituted to organism densities of 200-400 per milliliter. A 1 milliliter subsample was then extracted and counted and identified in a Sedgewick-Rafter cell. For

the purposes of this study we focused on counts of calanoid copepods, a key food source for delta smelt (Nobriga 2002; Bennett 2005).

The Summer Townet Survey (TNS) has been conducted annually by DFG 1959. The survey was designed to index the abundance of age-0 striped bass, but also collects delta smelt data that have been used to analyze abundance, distribution, and habitat use (Kimmerer 2002; Bennett 2005; Nobriga and others 2008). The TNS samples up to 32 stations using a conical net (1.5 m<sup>2</sup> mouth; 2.5 mm cod-end mesh) towed obliquely through the water column.

The DFG fall midwater trawl (FMWT) samples fishes in open-water and other offshore habitats monthly each September to December at 116 stations throughout the northern region of the estuary. The survey at each location takes a 10 to 12-minute tow with a 13.4 m<sup>2</sup> midwater trawl of variable meshes starting with 20.3 cm mesh at the mouth of the net and 1.3 cm mesh at the cod end (Feyrer et al. 2007). The survey represents one of the best long-term fishery data sets for the San Francisco estuary and covers the majority of the range of delta smelt. The FMWT samples delta smelt distribution and relative abundance during the period leading up to, but not including their spawning migration. Thus, it provides a long-term dataset on where delta smelt are distributed in the estuary. The survey has been conducted since 1967 with the exception of 1974 and 1979.

The DFG Spring Kodiak Trawl survey (SKT) has been conducted since 2002 as a survey to assess the distribution of adult delta smelt during the time they ripen and spawn (Source: <http://www.delta.dfg.ca.gov/data/skt/>). It samples 39 locations from Napa River upstream through Suisun Bay and the Delta (Figure 1). The survey has been conducted



every 2-4 weeks in winter and spring starting in January or February. At each location, a single 10 minute surface sample is taken by two boats that tow a 7.6 m wide by 1.8 m high Kodiak trawl (mesh ranges in dimension from 5.1 cm knotted stretched mesh at the mouth and decreases by 1.3 cm through a series of 5 panels to 0.6 cm knotless stretched mesh at the cod-end).

The USFWS Beach Seine Survey uses a 12-meter long by 1.2 meter high seine to collect inshore fishes from areas generally less than one meter deep (Brandes and McLain 2001). Seine hauls are conducted year-round at 57 current sampling stations from San Francisco Bay upstream to the lower Sacramento and San Joaquin Rivers. Unlike most other surveys, basic substrate data is collected for this program. In addition to the core USFWS, we examined data from special surveys in Liberty Island, a flooded tidal wetland in the Cache Slough Complex. The surveys during August 2002-October 2004 used similar methods as the regular USFWS Beach Seine program at ten core sites located around the periphery of the lower portion of the island (Figure 2).

*Short-term and geographically-limited studies:* One of the key studies used to identify habitat use by delta smelt was the DFG Delta Resident Fishes Survey (Brown and Michniuk 2007). This survey used an electrofishing boat to sample 200-m reaches of shoreline spread across several delta regions. The timing of this survey has been sporadic, with sampling that collected delta smelt in 1981-1982, 1995-1997, and 2001-2003.

Another source of data about delta smelt use of small channels was the California Department of Water Resources Yolo Bypass study, which includes larval sampling and rotary screw trapping. This sampling occurred near the base of Yolo Bypass in a 40 m

wide perennial channel. Methods for the two surveys are summarized in Sommer and others (2004a) and Feyrer and others (2006).

*Data Analyses:* Delta smelt are a relatively rare and patchy fish, so most survey data were summarized based on presence-absence data. To summarize the general locations of delta smelt habitat by life stage, we summarized the upstream and downstream distribution limits for each of the major surveys: FMWT, SKT, 20 mm, and TNS. The center of distribution was calculated for each survey (Sommer and others 2011b). Data were summarized separated for wet and dry years using all years since 1995, when all four surveys were conducted.

For several analyses, we calculated the percentage of samples with delta smelt present for under different conditions (e.g. substrate, geographic locations). Where possible, we did statistical analyses. For example, we used this approach for USFWS beach seine data to compare delta smelt habitat use in Liberty Island as compared to concurrently collected data from the core west and north Delta station region where the population is often centered (Sommer and others 2011a; Figure 3). We focused on six west and north Delta stations (Sandy Beach SR012W; Stump Beach SR012E; Rio Vista SR014W; Brannan Island TM001N; Eddo's SJ005N; Sherman Island MS001N; Antioch Dunes SJ001S) that commonly catch delta smelt. Differences in percent of samples with delta smelt were compared for the Liberty Island (Figure 2) and the core Delta sites during the same sampling period (2002-2004) using a Kruskal-Wallis test. The USFWS beach seine data for the core Delta stations were also used to evaluate substrate use. Only data after 1993 were used because they included substrate information (mud, pavement, vegetated, sand, gravel). We did a Chi-square test comparing the number of samples in which delta

smelt were captured on each substrate type to the total samples (i.e. effort) on each substrate type. However, we acknowledge that fixed stations are not an optimal approach to habitat use. One concern about the use of fixed stations is that salinity-induced shifts in the distribution of delta smelt along the axis for the estuary, which may “push” delta smelt away from or towards certain substrate types.

Food was analyzed for the 20 mm survey, the only IEP sampling program which collects data simultaneous with fish at each station. As others have shown, generalized additive models (GAMs) can be used to examine the associations between fish occurrence and habitat variables such as salinity, temperature, and turbidity (Stoner and others 2001; Feyrer and others 2007; Kimmerer and others 2009). We examined whether adding food availability improved the model predictions for delta smelt. The technique uses smoothers to describe the empirical relationships between predictor and response variables and therefore does not assume particular relationships between the two. We used the GAM function in the MGCV package of the statistical program R (R Development Core Team 2011; Wood 2011) with a logit link function to determine whether there were significant relationships between four response variables (mean temperature; mean EC; mean secchi depth; mean calanoid copepod density) and the presence of delta smelt in 20 mm samples for 1995-2009. The variables were tested both individually and in combination with each other. We analyzed the GAM results in two ways. First, we examined whether the smoothed results were congruent with expected responses based on laboratory tests and ecological literature. Specifically, we expected that delta smelt would show a unimodal response to temperature and salinity, a declining occurrence relatively to Secchi (Feyrer and others 2007), and an increasing or saturating

response to food availability (e.g. Holling 1959). Second, we assessed statistical significance of the GAM outputs using an approximation of the ability of each variable to reduce null deviance in the models (Venables and Ripley 1997; Feyrer and others 2007).

## **Delta Smelt Habitat: A Synthesis**

### **Basic Habitat Requirements**

**Salinity:** Salinity is the main factor that defines an estuary, so understanding salinity requirements is an essential in describing the habitat of estuarine organisms. Because of the ease of measurement, salinity is often represented based on electrical conductivity. The two units are not strictly interchangeable because of variation in the ionic composition of different regions of the San Francisco estuary (e.g. oceanic salts vs. agricultural salts in the San Joaquin River).

More so than any other delta smelt habitat variable, salinity has been the subject of intense research and debate. Higher flow levels shift the salt field downstream, as commonly represented by X2, the distance of the 2 psu salinity isohaline from the Golden Gate Bridge (Jassby and others 1995; Kimmerer 2002). There are no long-term trends in the salinity of the upper estuary for most months (Jassby and others 1995; Enright and Culbertson 2010); however, there have been salinity increases during fall (Feyrer and others 2007), when the issue has become most controversial.

Delta smelt are strongly associated with the low salinity zone, typically <6 psu or <10,000 uS/cm (Feyrer and others 2007; 2010; Kimmerer and others 2009). Our GAM

results for the 20 mm survey showed a similar pattern (Figure 4; Table 1). The distribution of delta smelt is therefore affected by salinity at multiple life stages. For example, Dege and Brown (2004) found that the center of distribution of young delta smelt during spring was determined by the location of the salt field, with a more downstream distribution during wetter years. Similarly, Sommer and others (2011a) found that the center of distribution of older delta smelt was consistently associated with the location of the salt field (X2) during all months. As will be discussed below, this does not mean that all smelt are confined to a narrow salinity range since fish occur from fresh water to relatively high salinities.

The effects of salinity on habitat area vary seasonally and therefore by life stage. Kimmerer and others (2009) found that X2 had a negative association with habitat area (i.e. higher flow = more area) for all surveys analyzed, but the effect was strongest in spring and summer. They suggest that earlier life stages were more responsive to salinity changes because they tend to occupy fresher water than older delta smelt. Despite a clear effect of estuarine salinity on habitat area, Kimmerer and others (2009) did not observe strong effects on abundance. Feyrer and others (2010) also found a negative effect of X2 on habitat area during the fall. Feyrer and others (2007) report a long-term decrease in habitat area based on the combined effects of salinity and turbidity (as indexed by Secchi depth), and a weak effect of fall conditions on juvenile production the following summer. The significance of these results has been the source of intense debate as part of legal challenges to the USFWS (2008) Biological Opinion for delta smelt, which included new requirements to change X2 during the fall of wet years.

318           **Tides and Flow:** There have been occasional collections of delta smelt upstream  
319 of the tidal zone north of Sacramento (USFWS Juvenile Salmon Survey, unpublished  
320 data). All of these occurred during the winter and spring spawning season. Despite these  
321 rare exceptions, the habitat of delta smelt is focused entirely in the tidal zone. It is not  
322 known if delta smelt can survive in areas without consistent tidal flows as may be the  
323 case for some areas in the future with sea level rise (see below).

324       Delta smelt currently are found in the small channels such as the Yolo Bypass Toe  
325 Drain, where tidal flows are periodically less than  $\pm 4 \text{ m}^3/\text{sec}$  during months when smelt  
326 are present (Lisbon Gauge, Department of Water Resources, unpublished data), to areas  
327 with stronger tides such as Chipps Island, where representative summer tidal flows are  
328  $\pm 9400 \text{ m}^3/\text{sec}$  (DWR 1993). It is highly likely that delta smelt use some form of tidal  
329 surfing to change their location in the estuary (Swanson and others 1998; Sommer et al.  
330 2011a). Bennett and others (2002) provide evidence that young longfin smelt (*Spirinchus*  
331 *thaleichthys*) use tidal surfing to maintain their position in the estuary, so it is reasonable  
332 to assume that a close relative like delta smelt does the same. Sommer and others (2011a)  
333 used a particle tracking model to show that apparent upstream migration rates of adult  
334 smelt were consistent with simulations based on a simple tidal surfing behavior.

335       **Velocity:** Closely related to tides and flow is water velocity. This variable may be  
336 much less relevant to fishes in the highly tidal upper San Francisco estuary than for  
337 species that live in riverine systems. Even in a tidal environment, it is likely that delta  
338 smelt respond to covariates of velocity such as turbulence, so velocity should not be  
339 ignored as a habitat feature.

The effects of water velocity on delta smelt are understood primarily from laboratory studies. Swanson and others (1998) showed that maturing delta smelt probably can swim for long periods at rates of 1-2 body lengths per second, representing about 6-12 cm per second. Critical swimming velocities were around 28 cm/second. These rates were comparable or somewhat lower than similar-sized fishes for the same temperature range.

**Turbidity:** Important progress in our understanding of the habitat needs of delta smelt is that the species requires turbid water. Traditionally, fisheries biologists have viewed high turbidities as a detriment to fish based on extensive evidence that high sediment loads degrade the quality of salmon habitat (Newcombe and Macdonald 2011). This has led to widespread regulations for logging and construction projects along the Pacific Coast to limit sediment loading to rivers. However, Feyrer and others (2007) found that delta smelt are strongly associated with turbid water. Their results showed that during fall delta smelt are only present at locations where Secchi depth is less than 1 meter deep. This finding is consistent with Grimaldo and others (2009a), who found that the occurrence of delta smelt at the SWP salvage facilities was linked, in part, with high turbidities. Specifically, delta smelt were not present when turbidities were less than about 12 ntu. This results are consistent with our GAM analyses of the 20 mm data set, which showed that young delta smelt are strongly associated with lower Secchi depths (Figure 4: Table 1).

The specific mechanism by which delta smelt require high turbidity is not known. An obvious potential function of turbidity is that it may help delta smelt avoid visual predators (Baskerville-Bridges and others 2004; Feyrer and others 2007; Nobriga and Herbold 2009). Light apparently plays a role in feeding ecology as laboratory studies

show that consumption is low in clear water ((Mager 1996; Baskerville-Bridges and others 2004). It is possible that turbidity helps create a contrasting background for delta smelt to locate their prey.

One of the most disturbing long-term changes in for delta smelt has been the increase in water clarity in the upper estuary (Jassby and others 2002; Wright and Schoellhamer 2004; Feyrer and others 2007). Moreover, modeling by Schoellhamer (2011) suggests that there has been a sudden recent (1999) increase in water clarity as the sediment balance shifted. In contrast to other habitat variables such as salinity, these trends are not driven by hydrology (Jassby and others 2002). As noted in Baxter et al. (2010), the primary mechanisms suggested to explain the increasing water clarity are: 1) reduced sediment supply due to dams in the watershed (Wright and Schoellhamer 2004); 2) major flood events (e.g 1982-1983) that washed out large amounts of sediment (Baxter and others 2010); and 3) biological filtering by submerged aquatic vegetation (Brown and Michniuk 2007, Hestir and others In review). Whatever the mechanisms, this change appears to have had a serious effect on habitat quality for delta smelt during both summer (Nobriga and others 2008) and fall (Feyrer and others 2007).

**Temperature:** Upper temperature limits for delta smelt habitat have been relatively well-studied in both the laboratory and using field data. Interpretation of the laboratory results is somewhat complicated as temperature limits can be affected by various factors including acclimation temperature, salinity and feeding status. The general pattern is that delta smelt cannot tolerate temperatures higher than 25°C (Swanson and others 2000), a level that is highly consistent with field collections of young smelt (Nobriga and others 2008) and our GAM results for the 20 mm data set (Figure 4; Table 1). Hence, the 25°C



is currently used at the general guideline to assess the upper limits for delta smelt habitat (Wagner and others 2011; Cloern and others 2011).

The lower limit to water temperature has not yet been evaluated in detail. However, Bennett and Burau (2010) analyzed the occurrence of adult in the Spring Kodiak Trawl based on three water quality variables. Their preliminary results suggest that delta smelt are rare below about 7°C. Note, however, that temperatures below 10°C are uncommon in the estuary (Kimmerer 2004; Nobriga and Herbold 2009).

**Depth:** Like velocity, the relevance of depth to a pelagic fish in a tidal estuary is open for debate. Landscape variables such as depth are, nonetheless, clearly important features that define tidal dynamics such as velocities, excursion, and frequency of inundation. Unfortunately, depth is not recorded for many of the pelagic trawls in the upper estuary making it difficult to evaluate this variable. Some data are available for littoral surveys, but delta smelt catch is generally too low for a rigorous statistical analysis. While generally regarded as a pelagic fish (Moyle 2002), delta smelt are clearly caught in shoal and shallow inshore areas such as Suisun Bay and Liberty Island (Moyle and others 1992; Nobriga and others 2005; Sommer and others 2011a). Aasen (1999) found that juvenile smelt densities can actually be higher in shoal areas than adjacent channels. However, delta smelt use of shallow areas apparently varies with tide (Aasen (1999) and they probably do not substantially use the shallowest tidally dewatered edge areas (Matt Nobriga, USFWS, unpublished data). There does not appear to be an obvious maximum depth for delta smelt as the fish are commonly captured along the Sacramento Deep Water Ship Channel (Grimaldo and others, In prep; DFG Spring Kodiak Trawl:

<http://www.dfg.ca.gov/delta/data/skt/DisplayMaps.asp>), which has most of the deepest habitat in the upper estuary.

**Channel size:** Most data has been collected in large channels, making it difficult to evaluate what types delta smelt prefer. It is likely that channel width itself is not a constraint; instead, delta smelt are likely to be cued into related habitat features such as tidal excursion, velocity, temperature, and turbidity. There does not appear to be a clear upper limit for channel width as the FMWT and TNS data show that delta smelt are common in large channels including broad bays that are several km wide. For example, some of the most numerically important areas for delta smelt catch are Cache Slough, a 200-280 m wide channel (20mm station 716, TNS & FMWT stations 716 and 721) and the Sacramento Deep Water Ship Channel, with a 170-200 m wide channel (TNS and FMWT stations 719 and 797).

The lower limit to channel size for delta smelt has still not been addressed. In the Delta, the smallest channels that we are aware of where delta smelt have been collected are around 45 m wide. One example is a small perennial channel of the Yolo Bypass—both adult and larval stages seasonally were collected there in many years (Sommer and others 2004). Another narrow channel with regular catches of delta smelt larvae is Miner Slough at 45-50 m wide (20 mm station 726). Downstream of the Delta, the smallest channel where adults and juveniles have been reported is Spring Branch Slough in Suisun Marsh, which averages about 15 meters near the sampling area of the UC Davis Suisun Marsh Survey (Meng and others 1994; Matern and others 2002). These fish are most commonly caught during winter, usually January to March (Teejay Orear, UC Davis, unpublished data).

**Food:** Even if physical and chemical requirements are met, delta smelt will not survive if habitat does not contain enough food to support basic metabolic needs. The food source of delta smelt is fairly specialized, relying primarily on calanoid copepods such as *Eurytemora affinis* and *Pseudodiaptomus forbsi* (Nobriga 2002; Moyle 2002). There has been a long-term decline in zooplankton in the upper estuary (Winder and Jassby 2010), which partially may account for the reduction in the mean size of delta smelt in fall (Sweetnam 1999; Bennett 2005). Overall, food limitation remains a major stressor on delta smelt (Baxter and others 2010). The importance of this variable is supported by Kimmerer (2008), who showed that delta smelt survival from summer to fall is related to biomass of copepods in the core range of delta smelt. These relationships have led to the recognition that food availability should be included in life cycle models of delta smelt (Maunder and Deriso 2011).

There is evidence of substantial spatial and temporal variation in copepods in the estuary. The most extensive database for zooplankton of the upper estuary is the IEP's Environmental Monitoring Program (<http://www.water.ca.gov/iep/activities/emp.cfm>), which includes stations in Suisun Bay, Suisun Marsh, and the West and South Delta. *P. forbesi* and *E. affinis* both frequently show their highest densities in the south Delta and Suisun Marsh (Hennessy 2009; Anke Mueller-Solger, unpublished data). *P. forbesi* is most abundant during summer to fall, while *E. affinis* largely disappears from the EMP sites in summer and fall.

From a restoration perspective, one of the more important recent findings has been that food resources are often more abundant around the periphery of the upper estuary. In the brackish zone, the smaller channels of Suisun Marsh frequently show relatively high

levels of chlorophyll *a* and copepods (Schroeter 2008; Anke Mueller-Solger, Delta Science Program, unpublished data). Similarly, studies by Benigno and others (In review) show that the channels of the Cache Slough Complex consistently have higher chlorophyll *a* levels than Delta EMP stations. The data suggest that calanoid copepod levels may be enhanced during key months for delta smelt. Longer residence times are likely a major contributing factor to increased food web production in these regions (Lucas and others 2009).

Food thresholds for delta smelt have not yet been established, although our GAM analyses provide some insights for spring. The GAM results of the 20 mm data set suggested that temperature, salinity, Secchi depth, and calanoid copepod density were all significantly associated with occurrence of young delta smelt (Table 1; Figure 4). However, the smoothed GAM results for calanoid copepods (Figure 4) did not follow the expected increasing or saturating responses (e.g. Holling 1959). Instead, the smoothed response suggested a questionable decline in delta smelt abundance at high calanoid copepod densities. An additional issue is that models that incrementally added each of the environmental variables indicated that adding calanoid copepods to the model explained only a small additional amount of deviance (2%) as compared to models with just the three physical variables (Table 1). These results suggest that calanoid copepod density was not a meaningful predictor of young delta smelt in the 20 mm survey. This does not mean that food is unimportant to young delta smelt; rather, the data may not be at a sufficient scale to detect associations.

**Substrate:** Most fish surveys in the upper Estuary do not record substrate, making it difficult to evaluate the importance of this variable to delta smelt. The relevance of

substrate in the deep channel habitat of delta smelt is questionable; for example, young smelt are typically in the middle or upper portion of the water column, particularly during day time (Rockriver 1994; Grimaldo and others, In review). Nonetheless, substrate may be relevant when delta smelt venture into littoral areas. Delta smelt catches are typically quite low in inshore areas, making it hard to analyze the data in any rigorous way.

The best available data about substrate use are from the USFWS beach seine survey (Table 2). The results suggest at least modest differences between observed and expected habitat use (Chi square = 29.15; DF = 3;  $p < 0.001$ ). Delta smelt were never collected in vegetation, despite 167 samples in such habitats. Habitat use was also much lower than expected at paved locations (boat ramps), but somewhat higher than expected over gravel, mud, and sand.

Another example is the DFG Resident Fishes Survey, which used electrofishing to sample nearshore areas during the early 1980s, mid-1990s, and early 2000s (Brown and Michniuk 2007). The survey did not have high enough catch of delta smelt to warrant statistical analysis. The 1981-1982 data collected delta smelt in 5% of 360 samples over the following substrates: rip-rap 41% of fish; mud bank 59% of fish. These proportions were very similar to the distribution of sampling effort among all sites. Sampling effort was much greater in later years (5,645 samples); however, delta smelt were collected in only 0.4% of samples. These fish were collected over rip-rap (38%), mud bank (47.6%), and sand beach (14.3%), which was somewhat different than the overall sampling effort for all sites (rip-rap 60%; mud bank 33%; sand beach 3%; mud flat 4%).

In general, these data suggest that delta smelt do not have particularly strong substrate preferences, which is not surprising given their niche as a pelagic fish. Nonetheless,

substrate may be an important issue during spawning. The substrate preferences of delta smelt are not known; however, many other smelts are known to favor sandy substrate for spawning (Bennett 2005). This substrate is relatively common in inshore areas of the west Delta (e.g. Sherman Island) and north Delta (e.g. Liberty Island and Sacramento Deep Water Ship Channel).

**Other Water Quality Factors:** The current state of knowledge about the effects of water quality problems including contaminants on delta smelt and other pelagic fishes has recently been summarized by Brooks and others (2011). The evidence to date indicates that although acute contaminant toxicity is not a likely cause for the population declines, sublethal stress from multiple factors including metals, nutrient-rich effluents, toxic algal blooms, and pesticides all degrade the habitat of delta smelt. For example, sublethal contaminant exposure can impair immune function and swimming ability of delta smelt (Connon and others 2011). Delta smelt distribution is known to overlap with several key contaminants (e.g. Kuivila and Moon 2004; Brooks and others 2011) and effects can be substantial depending on the level of exposure (Connon and others 2009).

The highest profile water quality issue has been inputs of ammonium to the Delta, primarily from municipal discharges. The largest source of ammonium to the system is the Sacramento Regional Wastewater Treatment Plant (Jassby 2008). There is no evidence yet of direct effects on delta smelt, but there are concerns about food web effects based on the finding that phytoplankton growth may at times be inhibited by high ammonium concentrations in the Delta and Suisun Bay (Wilkerson et al. 2006, Dugdale and others 2007; Glibert 2010; Glibert and others 2011). This could directly reduce

primary productivity and alter phytoplankton species composition, which may in turn affect the zooplankton community that delta smelt rely upon (Glibert and others 2011).

Another emerging and related concern for delta smelt is that there are periodic blooms of the toxic blue-green alga *Microcystis aeruginosa* during late summer, most commonly August and September (Lehman and others 2005). These blooms typically occur in the San Joaquin River away from the core summer distribution of delta smelt (Figure 3), but some overlap is apparent. Results by Lehman and others (2010a) indicate a strong likelihood that delta smelt are exposed to microcystins, which may in turn affect their habitat use (Baxter and others 2010). Laboratory studies demonstrate that the blue-green alga is toxic to another native fish of the region, Sacramento splittail *Pogonichthys macrolepidotus* (Acuna and others 2012). Indirect effects are also a major concern as *Microcystis* blooms are toxic to the primary food resources of delta smelt (Ger and others 2009; 2010a; 2010b).

Pesticide effects are less well understood, although effects may be substantial given that agricultural, commercial, and urban purchases of pesticides within the Delta and the upstream watershed averaged 21 million kg annually from 1990 to 2007 (Brooks and others 2011). Intermittent toxicity has been reported for *Ceriodaphnia dubia* an invertebrate surrogate for Delta prey species (Werner and others 2000) and *Hyaella azteca*, a common invertebrate bioassay species (Weston and Lydy 2010; Werner and others 2010).

#### **Geographical Range of Habitat**

A common misconception is that the habitat of delta smelt only occurs in the Delta. The monitoring data indicate that center of distribution for the population commonly occurs in the Delta during spring (Dege and Brown 2004) and fall (Sommer and others 2011a). However, the overall distribution of delta smelt habitat is much broader. To illustrate this point, we summarized survey data for different seasons and water year types by life stage (Figure 3). The survey data show that delta smelt habitat is often located well downstream of the Delta, commonly in Suisun Bay. Their habitat also varies substantially by life stage and water year. The habitat tends to be most landward (upstream) for adults (SKT survey) and most seaward for the other life stages (20 mm, TNS, FMWT). As expected based on their strong association with salinity (Dege and Brown 2004; Sommer and others 2011a), the habitat for younger life stages shifts landward in drier years (Figure 3).

Following the listing of delta smelt in the early 1990s, one of the most surprising initial discoveries was the presence of delta smelt in the Napa River, a tributary to San Pablo Bay (Figure 1). While they are generally caught in wet years (Figure 3), the fact that delta smelt can periodically use this downstream habitat is significant. Hobbs et al. (2007) found that use of habitat in this region results in a unique chemical signature in the otoliths of delta smelt and revealed that the portion of fish that use Napa River can be substantial (e.g. 16–18% of population in 1999).

Another key finding was that delta smelt heavily use the Cache Slough Complex (Sommer and others 2011a). As reported in Sommer and others (2011a), at least some delta smelt occur year-round in the region. Although it is unclear what percentage of the population occurs in this region, survey data suggests that this area sometimes seasonally



supports the majority of the delta smelt catch. To illustrate the importance of the Cache Slough Complex, FWS beach seine surveys during 2002-2004 show that delta smelt apparently occur year-round in Liberty Island (Figure 5) and were present in all stations sampled (Figure 2). Similarly, expanded efforts of the 20-mm, TNS and FMWT surveys into the Sacramento Deepwater Ship Channel found delta smelt June through October, the warmest months of the year (Baxter and others 2010). Delta smelt use of the Cache Slough complex appears to be substantial as the frequency of occurrence in Liberty Island habitats was comparable to FWS beach seine stations located in their core Delta habitat during 2002-2004 (Figure 6). These findings were relatively unexpected as the general assumption at the time was that delta smelt leave the north Delta after larval stage (Sommer and others 2011a). Moreover, flooded islands were generally considered poor-quality habitat for delta smelt in other parts of the Delta (e.g. Grimaldo and others 2004; Nobriga and others 2005).

Although the Napa River and Cache Slough Complex studies provide some cause for optimism with regard to the status and extent of delta smelt habitat, it is important to note one of the most troubling changes over the past four decades, the loss of the south Delta as year-round habitat for delta smelt. As noted by several studies (Nobriga and other 2008; Sommer and others 2011a), the historical data show that many delta smelt remained in the south Delta throughout the summer. While delta smelt still seasonally occur in the south Delta during winter and spring (Figure 3; Sommer and others 2011a), they are now absent in summer. Nobriga and others (2008) suggest that this is due to major habitat changes including the proliferation of aquatic weeds and associated declines in turbidity.

## **Habitat Types**

The general habitat use by delta smelt is basically a function of the features described in the previous sections. Table 3 provides a synthesis of some of the major types based on some fairly broad habitat classifications. The summary is not intended to reflect the temporal and spatial variability in delta smelt distributions within a given habitat; rather it is designed to demonstrate relative patterns among habitat types. Note also that historical collections of delta smelt in any one of these types does not guarantee that future habitat projects will support this species. Any one of a number of physical (e.g. turbidity; temperature), chemical (e.g. contaminants), and biological factors (e.g. food, competitors, predators) may limit the ability of delta smelt to colonize new areas.

## **The Future of Delta Smelt Habitat**

There is widespread consensus among scientists that the upper San Francisco estuary will be quite different in the future (Knowles 2010; Cloern and others 2011). Studies by Mount and Twiss (2005) predict that there is a high probability of massive levee failure in the foreseeable future. This will radically change the salinity distribution along with the types and locations of different habitats (Lund and others 2007; Moyle 2008). As a consequence, it is especially challenging to use observations on current delta smelt habitat to predict future changes. There have at least been efforts to model habitat based on future flow conditions through the present landscape. The results are fairly discouraging, with predictions of reduced area of low salinity habitat as soon as 50 years in the future (Feyrer and others 2011). Even more disturbing is the finding that within

100 years the number of lethal temperature days for delta smelt will greatly increase and that turbidities will decrease (Wagner and others 2011; Cloern and others 2011). At the same time major biological community changes are inevitable, along with very different physical and chemical regimes (Lund and others 2007; Cloern and others 2011). These issues raise the question of whether delta smelt will be able to persist with climate change. At the very least, the analyses help show that current habitat conditions are not sustainable (Lund and others 2007), making it critical to begin planning for ways to react to long term changes.

### **Management Implications**

The available information suggests a high degree of uncertainty about many aspects of delta smelt habitat (e.g. Brown 2003). This is to be expected given the relatively rare status of this species and the difficulty in directly measuring habitat use in a highly variable and turbid environment. This does not mean, however, that there is insufficient information to examine some of the management issues with delta smelt habitat. Some basic ideas are provided below. Note that we do not specifically address the issue of how much habitat would be required to generate a measurable increase in the population of delta smelt. Such analyses are notoriously difficult and uncertain, even for better-studied fishes such as salmonids (Roni and others 2010). A major part of the problem is that habitat often is not the only factor controlling fish abundance, likely the case for delta smelt (Sommer and others 2007; MacNally and others 2008; Baxter and others 2010).

639

640 *We know enough to attempt some large scale habitat projects.*

641

642         While there is not sufficient information to fully design delta smelt habitat,  
643 enough is known to attempt major projects to evaluate some of the key questions. For  
644 example, the salinity, turbidity, temperature, and food requirements provide a basic  
645 description of some of the most important habitat features. Moreover, the large  
646 unintentional flooding of Liberty Island and subsequent colonization by delta smelt  
647 suggests that there is some potential to expand and improve the habitat of this imperiled  
648 species. Indeed, the status of delta smelt is so dire, that we cannot simply hope that the  
649 species will be able to recover without several different types of active management.  
650 It therefore seems prudent to proceed with one or more large scale projects provided that  
651 there is an intensive field monitoring and adaptive management process.

652         Since much of the proposed habitat restoration activities will likely occur in  
653 Suisun Marsh and the north Delta, we propose that new habitat projects try and emulate  
654 key aspects of these regions. Based on our analyses, some general suggestions are  
655 provided in Table 4. Note that these habitat features are not intended as the sole design  
656 criteria for this species. A given project will fail if the constructed habitat if it is subject  
657 to periodic water quality issues such as low dissolved oxygen, pesticides, and toxic algal  
658 blooms, or high levels of predators or invasive species. In general, maintaining high  
659 levels of variability and complexity has been suggested as a key approach to promote  
660 native fishes (Moyle and others 2010).

661

***Habitat restoration is highly vulnerable to several factors.***

The vulnerability of habitat restoration to future climate change was discussed above. However, even under limited climate change there are many factors than can undermine the value of habitat for delta smelt. Of primary concern is the effect of alien species, given the high level of invasions in the estuary (Cohen and Carlton 1998). Submerged aquatic vegetation such as *Egeria* can quickly colonize shallow areas of the Delta (Brown and Michniuk 2007), covering shallow open water areas that provide part of the habitat for delta smelt. A notable local example is Decker Island, where a restoration project was constructed next to a known “hot spot” for delta smelt, yet the small dendritic channels were rapidly choked with *Egeria*. SAV is especially attractive to invasive predators (Grimaldo and others 2004; Brown and Michniuk 2007), that create mortality risks for delta smelt. However, SAV is not necessary for predator colonization as recently-created open water areas such as Liberty Island now support large numbers of striped bass and inland silverside. In addition, it is possible that new habitat projects may be subject to harmful algal blooms or localized runoff problems. The bottom line is that delta smelt habitat restoration may be hard to achieve since there are many pitfalls. Careful site selection and design coupled with intensive monitoring will be needed to minimize these risks.

***Bet hedging is critical***

Our review of the habitat needs of delta smelt reveals substantial uncertainty about specific features that will support this fish. Given the high level of uncertainty, a sensible approach is to adopt a “bet hedging” strategy coupled with intensive monitoring and evaluation. Of particular importance is the development of habitat projects in more than one geographic area that include multiple habitat types. This is critical given the projection for future climate change (Wagner and others 2011; Cloern and others 2011), the vulnerability of the Delta to floods and earthquakes (Mount and Twiss 2005; Moyle 2008), and the apparent diversity of delta smelt life histories. An emerging story is that the delta smelt do not undergo uniform upstream migration of adults followed by downstream migration of juveniles into the low salinity zone (Sommer and others 2011a). The year-round presence of delta smelt in the north Delta region is evidence of divergent migration pathways (Sommer and others 2011a). Indeed, new otolith research by Hobbs (2010) suggests that the range of life histories includes freshwater spawning/freshwater rearing, freshwater spawning/brackish rearing, brackish spawning/brackish rearing with multiple variations in the specific timing. Again, this means that a single habitat type or region should not be the focus of habitat restoration for delta smelt.

*Processes may be more important than specific habitat features*

Habitat restoration projects typically try and maximize the specific features that the target species prefers. Obviously, this is a key first step as fishes like delta smelt cannot colonize a habitat unless its basic environmental needs are met. Unfortunately, this can result in over-engineering of habitats, something that may not be justified given

the high level of uncertainty about delta smelt habitat and the future of the delta. We propose that an increased emphasis on processes may be more successful than the construction of well-engineered “gardens”. Key processes include sustainability and food web subsidies across habitats.

With regard to sustainability, habitats need to be designed to accommodate anticipated changes that will occur over the next century and beyond. Key changes include a declining sediment load (Wright and Schoellhamer 2004) that will strongly affect accretion and degradation rates of delta habitats, and sea level rise which is expected to eventually submerge many lower elevation sites. Careful selection of sites to progressively accommodate sea level rise is therefore a high priority. The declining sediment load is more problematic, but locating restoration areas in sites with relatively higher sedimentation or re-suspension rates may help to alleviate problems.

Although most of the carbon inputs to the food web appear to be from riverine inputs (Jassby and Cloern 2000; Kimmerer 2004), there is a growing ecological recognition that there may be substantial localized inputs across adjacent habitats. This is certainly the case with Yolo Bypass, which exports primary and secondary production to downstream areas (Schemel and others 2004; Sommer and others 2004b). Liberty Island may also export production during some seasons (Lehman and others 2010b). However, some areas such as SAV habitat in other parts of the Delta show evidence of being trophically decoupled from offshore food webs (Grimaldo and others 2009b), so few subsidies are expected across these habitats. The degree to which tidal marsh habitat may subsidize adjacent pelagic habitat remains unclear (Brown 2003), but there is some evidence that marsh exports could be important. In general, phytoplankton and

zooplankton levels are higher in small channels surrounded by dense emergent vegetation in Suisun Marsh (Rob Schroeter, UC Davis, unpublished data). This may be more a function of longer residence time in these low order channels, but marsh subsidies are also likely. In any case, it seems wise to consider habitat projects in locations where trophic subsidies are most likely (Jassby and Cloern 2000).

*Several key studies are needed*

As suggested previously, delta smelt habitat restoration will not succeed unless there is a sufficiently high level of monitoring and research. Moreover, these types of studies are needed immediately in order to learn from existing habitat use by delta smelt, and to develop baseline data and methodologies to evaluate project success. With respect to habitat use, we have learned quite a bit about the basic needs of delta smelt from long-term monitoring and laboratory studies, but we expect that much more information would be gained from efforts designed specifically to assess habitat use. Specifically, stratified randomized sampling methods are a more statistically defensible way to assess habitat use than fixed stations and can be customized to evaluate habitat types and features not covered by the existing monitoring network. Such surveys would be a useful supplement to the existing long term monitoring conducted in the estuary. Initial efforts should be focused on locations such as Suisun Marsh and the Cache Slough Complex, the two major target areas for restoration and existing “hot spots” for delta smelt.

An ongoing issue for the study of delta smelt habitat has been that this listed species is rare and fragile, so “take” is generally a concern. This means that we are



unlikely to be able to greatly increase our sampling efforts in areas where delta smelt are common. A major priority is therefore the development of improved telemetry, marking and imaging techniques to minimize take of delta smelt. In the short term, perhaps the most promising method is the use of underwater cameras. There are currently studies investigating the use of a towed net fitted with a camera at its (open) cod end (Baxter and others 2010). The camera and associated image processing software were successfully used in fall 2011 to identify and record delta smelt in several locations of the low salinity zone. Such methods may allow much more intensive sampling of different habitats without incurring high mortality. Better use of samples from the existing monitoring program using novel approaches such as otolith microchemistry may provide additional insight into delta smelt habitat use and migration patterns (Hobbs and others 2007; Hobbs 2010).

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1159 Society (B) 73(1):3-36  
1160

1161 Table 1: Generalized additive modeling (GAM) delta smelt results for the 20 mm survey  
 1162 including Temperature (T), Specific Conductivity (C), Secchi depth (S), and Calanoid  
 1163 Copepod Density (F). The variances in each model were all statistically significant  
 1164 ( $P < 0.00001$ ) based on approximate Chi square tests.

1165

Model	Residual Deviance (Percentage of total explained in parentheses)
T	5158 (7.1)
T + C	4876 (12.2)
T + C + S	4640 (16.4)
T + C + S + F	4514 (18.7)

1166

1167

1168

1169 Table 2: Substrate use by delta smelt as sampled by six core USFWS beach seine  
 1170 stations in the west Delta since 1993 (see text for details). The Chi-square analysis  
 1171 excluded vegetated substrate because it included no catch, which violates the assumption  
 1172 of that test.

1173

Substrate	Samples with delta smelt	Total samples (effort)
Gravel	6	338
Mud	39	2483
Pavement	6	2508
Sand	116	6945
Vegetation	0	183

1174 Chi square = 29.15, DF = 3,  $p < 0.001$  (Excluding vegetation)

1175

1176

1177

1178 Table 3: Habitat types in which delta smelt have been collected: \*= rare; \*\*=periodic,

1179 \*\*\* = common. As noted in the text, historical observations do not ensure that newly

1180 created habitats will support delta smelt.

Region	Habitat	Present	Comments	Sources
<b>Marine</b>  Examples: Lower Napa River, San Pablo Bay	-Bay  -Channel  -Marsh	*  *  **	Generally only during high flow events.  Collections adjacent to Napa marshes.	Bennett (2005); Hobbs and others (2007); DFG Bay Study & Townet Survey.
<b>Brackish</b>  Examples: Suisun Bay, West Delta	-Bay  -Channel  -Marsh	***  ***  **	Core habitat.  Core habitat.  Collections adjacent to Suisun Marsh.	Moyle and others (1992); Aasen (1999); Bennett (2005); Feyrer and others (2007); Dege and Brown (2004); Sommer and others (2011a); UCD Suisun Marsh Survey (unpubl).
<b>Freshwater</b>  Examples: Sacramento River, Cache Slough, Sacramento Deep Water Ship Channel.	-Non-tidal  -Tidal channel  -Littoral  -Emergent marsh.  -SAV	*  ***  ***  ?  *	Rare, highly seasonal.  Primarily North Delta.  Primarily North Delta.  Little sampling.  Collections adjacent to SAV.	Aasen (1999)  Grimaldo and others (2004); Nobriga and others (2005); Sommer and others (2011a); DFG Fall Midwater and Kodiak Trawls; FWS Juvenile Salmon & Liberty Surveys (unpubl); This Report.

1181

1182 Table 4: Suggested habitat features for pilot delta smelt restoration projects. See text for  
 1183 details.  
 1184

Habitat Feature	Comments	Citations
<i>Low salinities</i> <ul style="list-style-type: none"> <li>Typically &lt;6 psu</li> </ul>	The best-studied variable that defines the habitat of delta smelt.	Bennett (2005) Feyrer and others (2007) Kimmerer and others (2009)
<i>Moderate temperatures</i> <ul style="list-style-type: none"> <li>7-25° C</li> </ul>	The upper temperature limits appear consistent for laboratory and field studies, but tolerance is strongly affected by food availability and acclimation conditions. Lower limits have not been studied in detail, but stress from very low temperatures is likely.	Swanson and others (2000) Bennett (2005) Nobriga and others (2008) Bennett and Burau (2010)
<i>High turbidity</i> <ul style="list-style-type: none"> <li>&gt;12 ntu</li> </ul>	Regions with shoal habitat and high wind re-suspension may help maintain high turbidities.	Feyrer and others (2007) Grimaldo and others (2009a)
<i>Sand-dominated substrate</i>	May be useful as spawning substrate.	This report.
<i>At least moderately tidal</i>	Delta smelt are only rarely observed outside tidal areas.	This report.
<i>High copepod densities</i>	Delta smelt survival appears to be linked to higher levels of calanoid	Nobriga (2002)

	copepods in the low salinity zone.	Moyle (2002)  Kimmerer (2008b)
<i>Low SAV</i>	The absence of delta smelt in most SAV sampling indicates that submerged vegetation degrades habitat value.	This report.  Grimaldo and others (2004)  Nobriga and others (2005)
<i>Low Microcystis</i>	The absence of delta smelt in areas with periodic Microcystis levels indicates that these blooms degrade habitat values.	Baxter and others (2010)  Lehman and others (2010)  This report.
<i>Open water habitat adjacent to long residence time habitat (e.g. low order channels; tidal marsh).</i>	This concept has not been tested statistically, but the frequent occurrence of delta smelt in these habitats suggests that it may be important.	Aasen (1999)  This report.

1185



## Figure Legends

Figure 1. The San Francisco estuary including key landmarks noted in the text. The Delta is the area between Chipps Island, Sacramento, and just south of Stockton.

Figure 2. Locations of USFWS beach seine sampling in Liberty Island. The stations starting counter clockwise from the southeast corner of the site are: Liberty Island East #1-5 and Liberty Island #1-5. The data show the percentage of samples with delta smelt in different parts of Liberty Island based on data from August 2002- October 2004 (n = 607 hauls).

Figure 3. Summary of the extent of delta smelt habitat for four surveys: FMWT, SKT, 20 mm, and TNS. The data are for 2002-2010, when all surveys were conducted. The lines show the upstream and downstream limits of catch for wet (left panel) and dry (right panel) years based on the distance from the Golden Gate Bridge. The circles represent the center of distribution for each survey (see text and Sommer and others 2011a). Note that the surveys do not include inshore habitat or locations around the periphery of the estuary (e.g. Liberty Island, upper Deep Water Ship Channel).

Figure 4. Generalized additive (GAM) model predictions of delta smelt occurrence in the 20 mm survey (based on all four habitat variables) verses the habitat variables for: a) water temperature; b) specific conductivity; c) Secchi depth; and d) calanoid copepod density.

1209

1210 Figure 5. Distribution of catch of delta smelt across seasons in Liberty Island based on

1211 USFWS beach seine data from August 2002- October 2004 (n = 93 fish).

1212

1213 Figure 6. Percentage of beach seine samples with delta smelt in different parts of Liberty

1214 Island (ten “LI” stations) as compared to five core west and north Delta sites. Analyses

1215 are based on USFWS beach seine sampling in these locations during August 2002-

1216 October 2004. The locations of the Liberty Island stations are shown in Figure 2. The

1217 differences between the Liberty Island and core Delta stations were not significantly

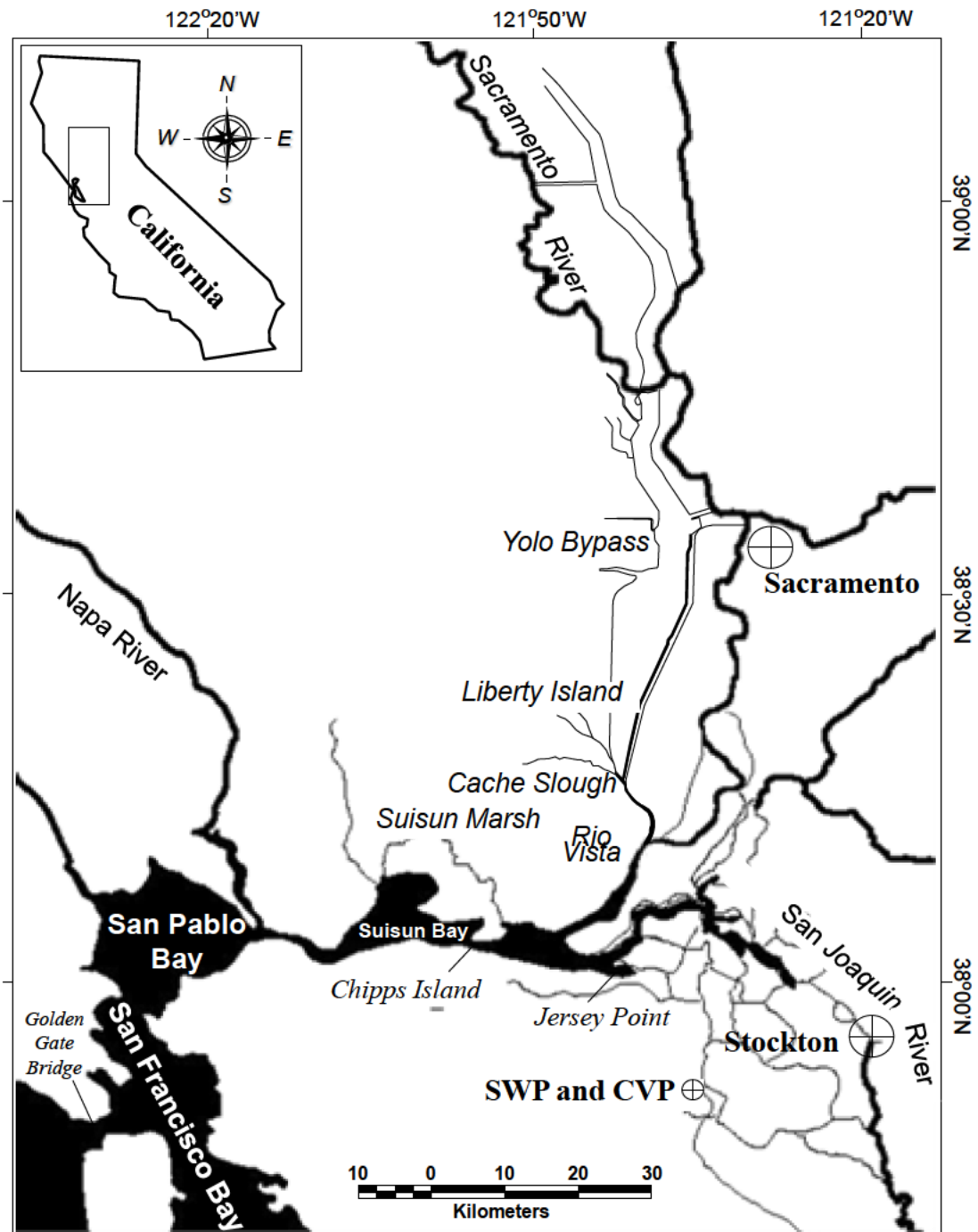
1218 different based on a Kruskal-Wallis test ( $p=0.065$ ).

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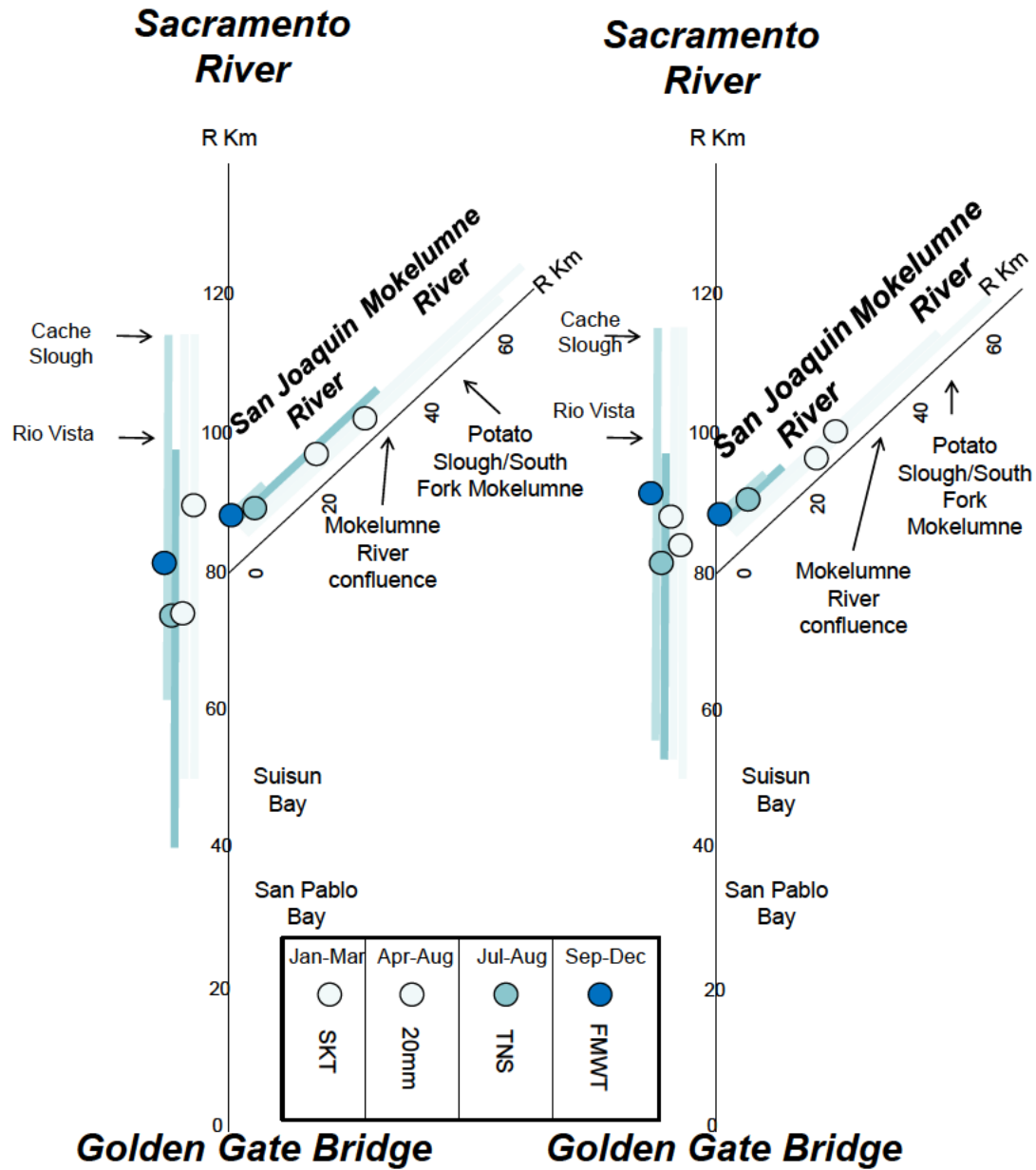
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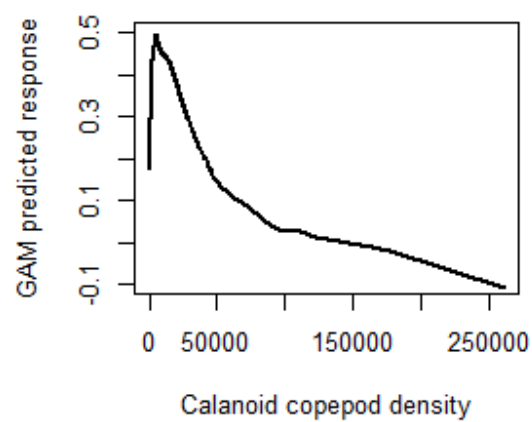
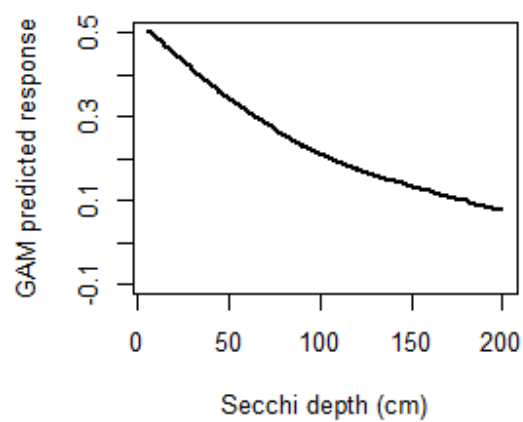
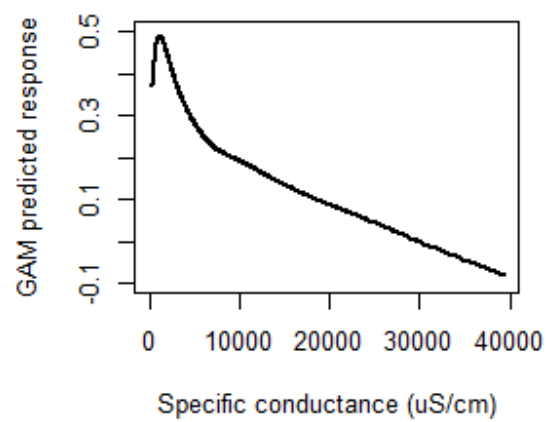
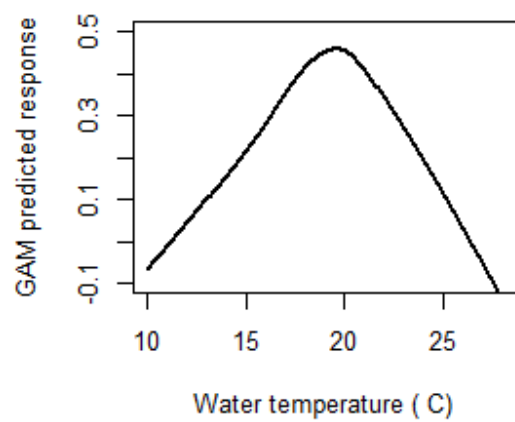
## WET YEARS

## DRY YEARS



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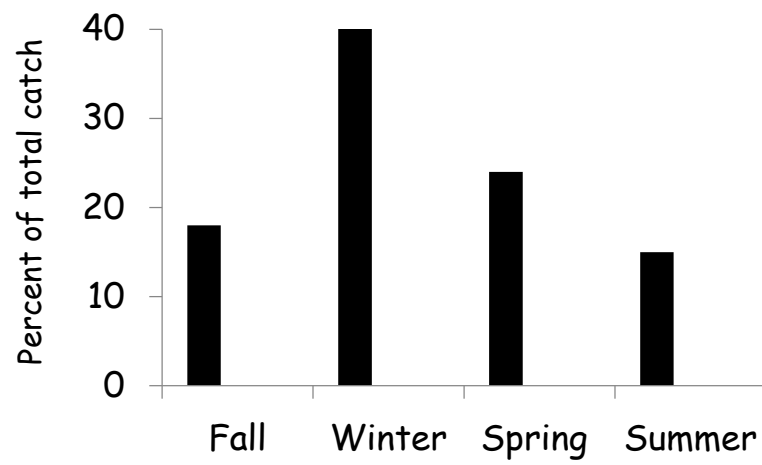
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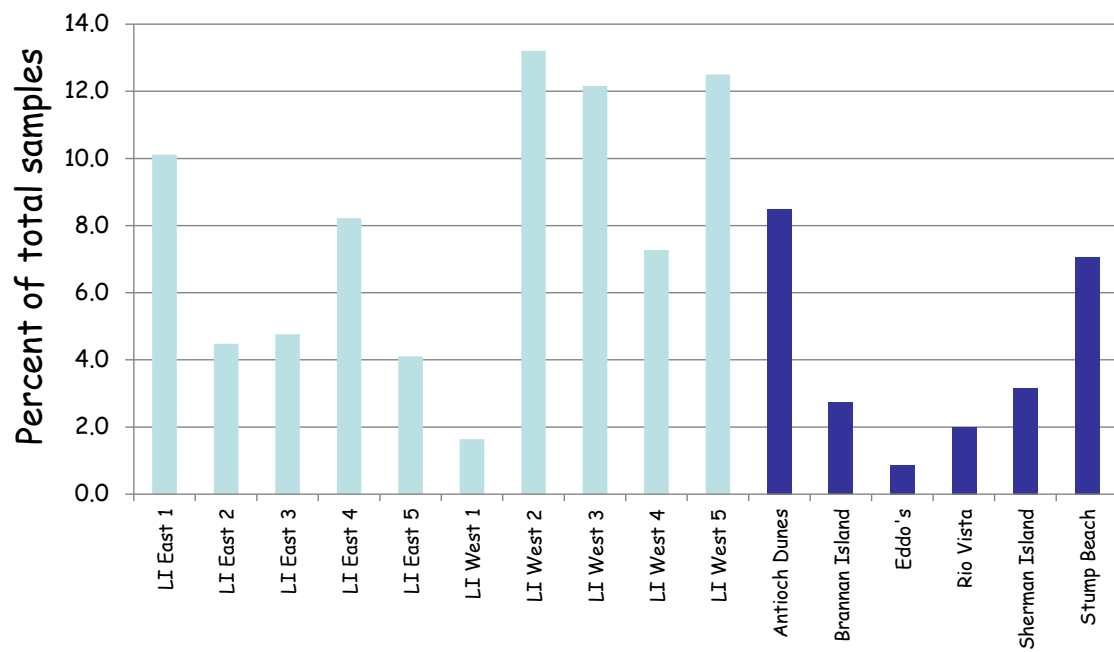


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**From:** Jason Peltier

**Sent:** Thursday, May 24, 2012 7:08 AM

**To:** Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLoyd Fryer; 'Martin McIntyre'; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** FW: Phyllis Fox's paper

**Attachments:** Phyllis Fox Paper.pdf

**From:** Jerry Johns [mailto:[jjohnswater@gmail.com](mailto:jjohnswater@gmail.com)]

**Sent:** Wednesday, May 23, 2012 9:30 PM

**To:** etiedemann@kmtg.com; jfeider@charter.net; joyw@mid.org; Allen Short; Andy Fecko; Anthony Andreoni; Ara Azhderian; Audrey Kelm; bbuck@sfcwa.org; Brenda Fotos; Brent ten Pas; Carl Torgenson; Craig T. Jones; Danny Merkeley; Dave Breninger; David Ansolabehere

**Cc:** B. J. Miller; Blair Jackson; Buzz Link; Don Imamura; Hari Modi; Lowell Watros; Nicholas Markevich; Norm Worthington; Rodgers, Kirk; Tom Mongan; Tom Patton; Walter Bourez

**Subject:** Fwd: Phyllis Fox's paper

Water and Power Policy Group,

At the WPPG meeting yesterday, many of you expressed interest in getting a copy of Phyllis Fox's paper on the likely "natural flows" in the Bay/Delta Estuary given all the flood plain habitat upstream. Here is a copy of her paper.

----- Forwarded message -----

From: **Jon Rubin** <[Jon.Rubin@sldmwa.org](mailto:Jon.Rubin@sldmwa.org)>

Date: Wed, May 23, 2012 at 8:27 AM

Subject:

To: "[jjohnswater@gmail.com](mailto:jjohnswater@gmail.com)" <[jjohnswater@gmail.com](mailto:jjohnswater@gmail.com)>

--

Jerry Johns

[jjohnswater@gmail.com](mailto:jjohnswater@gmail.com)

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**APPENDIX 2**

**FRESHWATER INFLOW TO SAN FRANCISCO BAY  
UNDER NATURAL CONDITIONS**

**Phyllis Fox**

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## FRESHWATER INFLOW TO SAN FRANCISCO BAY UNDER NATURAL CONDITIONS

Freshwater inflow to San Francisco Bay from the Delta is presently about the same as it was under natural conditions. Drainage, reclamation, flood control, and water development in the Central Valley have not significantly affected the quantity of freshwater reaching San Francisco Bay. Early development in the Valley increased outflows while subsequent development reduced them to about their initial level. Evaporative water losses from the original marshes and riparian forests in the Central Valley exceeded present in-basin use and exports by about 10 percent. The monthly distribution of flow into San Francisco Bay was much more uniform under natural conditions than it is presently, and winter and spring pulse flows that are common today were probably rare under natural conditions.

The results of our analyses are summarized in Figure 1, which shows changes in Delta outflow as the Valley develops. We have also plotted along the bottom of this chart the historic events that were responsible for the changes. Early development in the Valley increased Delta outflow from 13 million ac-ft/yr around 1770 to about 28 million ac-ft/yr between 1850 and 1900. The increase occurred primarily because high water-using vegetation (tule marsh, riparian forest) was replaced by lower water-using crops and urban areas. This native vegetation used over 17 million ac-ft/yr of water, more than is presently exported from and used within the Central Valley. The increase in water yield that occurred when native vegetation was removed was subsequently used primarily for agriculture and domestic water supply, returning freshwater inflow to about the amount that naturally reached San Francisco Bay.

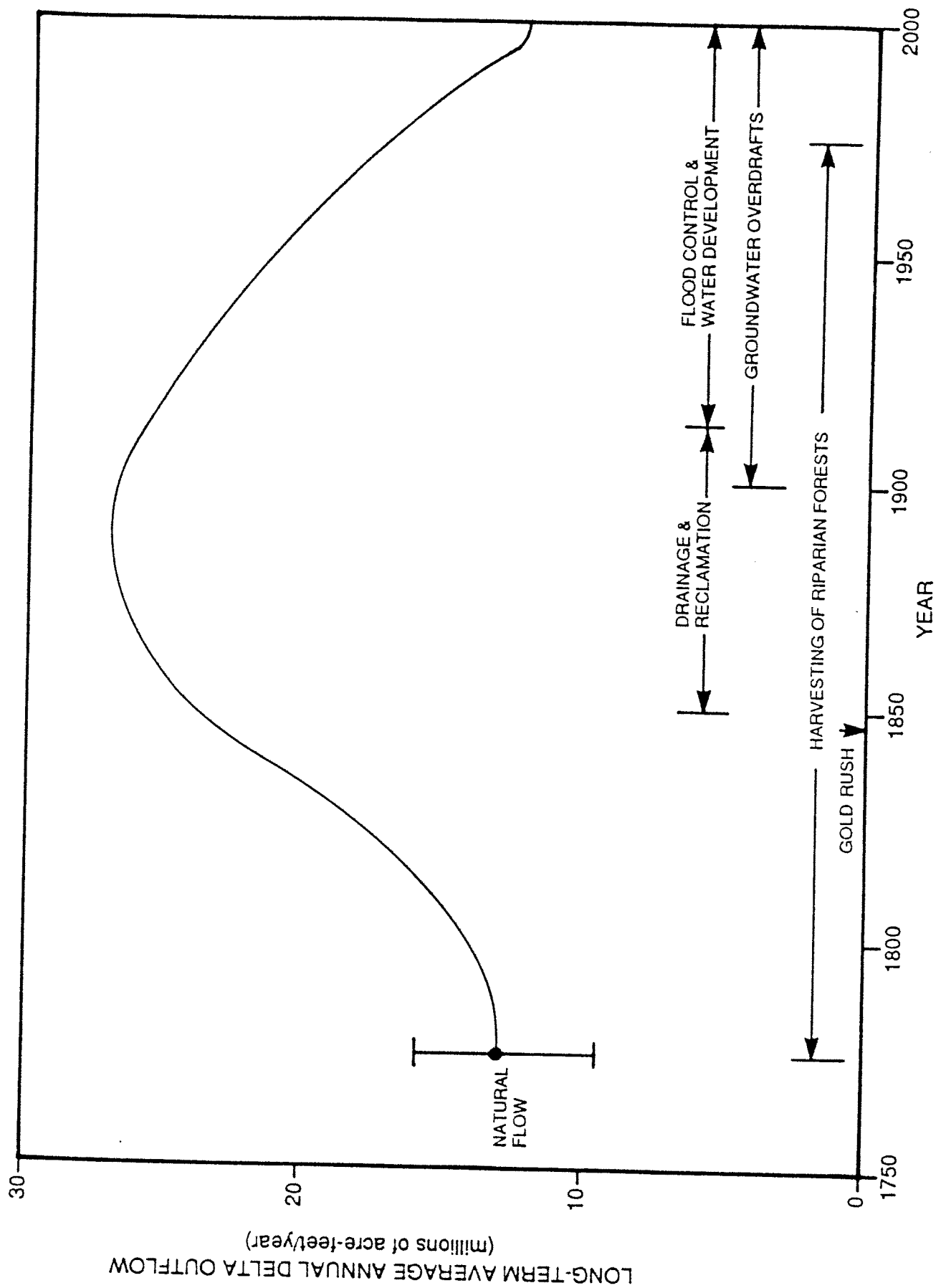


FIGURE 1. Summary of Historic Changes in Delta Outflows.

Originally, the trough of the Central Valley functioned as a reservoir filling and draining every year. Tule marshes choked these natural reservoirs and riparian forests lined the stream channels along the Valley floor. This natural vegetation took advantage of the plentiful supply of water, using far more than the irrigated crops that replaced them.

When the Central Valley was developed, the natural flood basins were drained, the tule marshes and riparian forest were replaced by irrigated crops, and the upslope forests were harvested. The original languid, slow moving, quasi-lake-like environment in the Central Valley was transformed into the highly channelized system with very short hydraulic residence times and high velocities that we know today. The principal result of upstream development has been to replace Valley reservoirs with man-made upstream reservoir storage and evaporative water losses by natural vegetation with consumptive use by agricultural crops and humans.

In this report, we estimate freshwater inflow to San Francisco Bay from tributary drainages in the Central Valley. Natural flows are defined here as those that occurred in a virgin, undisturbed state, prior to any significant human intervention. We use as our starting point the unimpaired flows calculated by the California Department of Water Resources [DWR 1987]. These estimates did not include the high evaporative water losses from natural vegetation, and they assumed present channel configurations.

## THE NATURAL LANDSCAPE

The physical geography and vegetation in upstream drainages to San Francisco Bay (Sacramento Basin, the Delta region, and the San Joaquin Basin) were massively altered during early settlement and development of the Valley. This section describes the natural hydrology and primitive vegetation of the Valley and outlines its transformation into the system we know today. We have organized our

discussion around the principal geomorphic features of the Valley as delineated by Bryan (1923, p. 9) — riverlands, flood basins, Delta islands, and plains. These features are shown in a schematic cross section of the Valley in Figure 2. Moving from the main rivers (Sacramento, San Joaquin) outwards are found the riverlands, flood basins, and plains.

In the following sections, we focus our discussion on the Central Valley because we intend, in the analyses that follow, to estimate freshwater inflow to the Bay using a water balance around this area. This region also contributes about 99 percent of the freshwater to the Bay. The Central Valley comprises about 20,000 square miles and extends from near Red Bluff in the north to near Bakersfield in the south, a distance of about 400 miles. The average width of the Valley is about 50 miles. We emphasize the area north of Fresno and the San Joaquin River because over 99 percent of the water of interest originates in that area. We include the Tulare Lake Basin overflow as an inflow to the Central Valley.

### **Riverlands and Riparian Forests**

The riverlands, the flood plains immediately adjacent to rivers and streams, and their riparian forests were one of the most prominent features of the Valley. They appeared as winding ribbons of green against a monotonously flat plain and were thus extensively described by early visitors [e.g., Farquhar 1932a]. In most parts of the Valley, the riverlands comprised banks of flood-borne sediments that were locally known as "rim lands" or "natural levees." These levees occurred along the Sacramento River from Red Bluff downstream and were most extensively developed in the river's middle reach from Ord Ferry to Sacramento. They were also present along the entire length of the San Joaquin River [Davis et al. 1959, p.27], though they were less well developed there because peak flows were typically less, thus limiting their ability to pick up and carry sediment for great distances [Katibah 1984]. Natural levees were also present in most Delta channels and along major



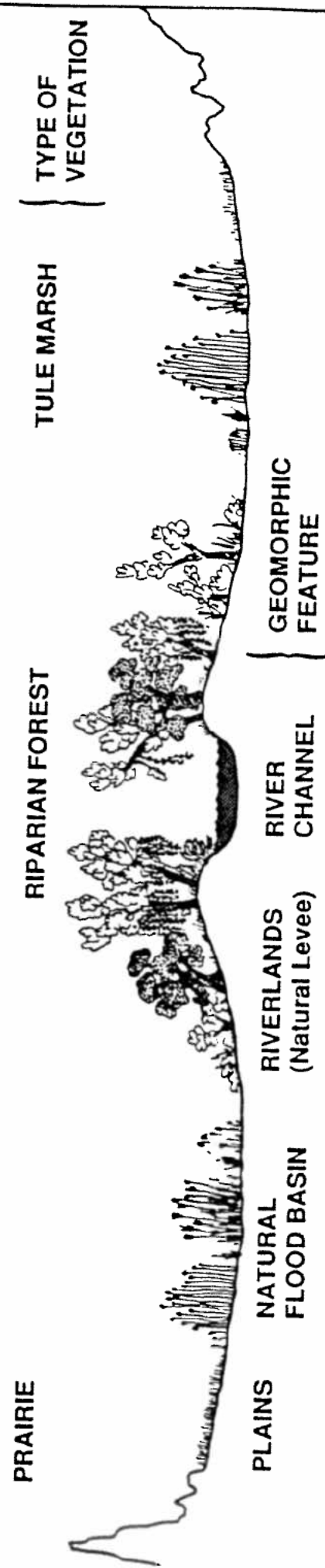


FIGURE 2. Typical Cross Section of Central Valley (Not to Scale) Showing Principal Geomorphic Features and Natural Vegetation.

tributaries, including the Feather, Tuolumne, Stanislaus, Merced, Mokelumne, Fresno, and Cosumnes Rivers. They rose some 10 to 30 feet above the normal water level and extended several miles back from the river's edge [Bryan 1923; Davis et al. 1959].

These levees confined the main streams to their regular channels when water levels were at low to moderate stages. They also prevented overland runoff from the foothills and Valley floor from entering the main channels. When winter and spring runoff were high, however, the natural levees were overtopped by annual flood flows. The levees also were more or less discontinuous, and breaks were common along the main river, allowing flood flows to escape the main channels and fill the natural basins flanking the main-stem rivers [Bryan 1923].

The natural levees were formed by repeated overflows of sediment-laden river water onto adjacent lands and occur where the valley slope is lowest and the duration of overbank flow is highest. The coarse, sandy material deposited close to the channel (sandy loams) gradually built-up, forming broad slopes that fall gently away from the river. In the Sacramento Valley, these flood plains are occupied by soils of the Columbia series [Holmes et al. 1916] and in the San Joaquin Valley, by soils of the Hanford loam series [Nelson et al. 1918]. Because they are primarily coarse sediment, these levees are extremely porous and transmit water readily.

These riverlands supported riparian forest habitat, which included Fremont cottonwood, box elder, valley oak, and various species of willow. Many shrubs, including buttonbush, honeysuckle, wild rose, and berry were also common [Bakker 1971; Jepson 1893; Thompson 1961; Roberts et al. 1977; Hoover 1935; Conard et al. 1977; Warner 1984]. Thompson (1961) has chronicled the eye witness accounts of riparian forests in the Sacramento Valley, and Landrum (1938) has provided similar

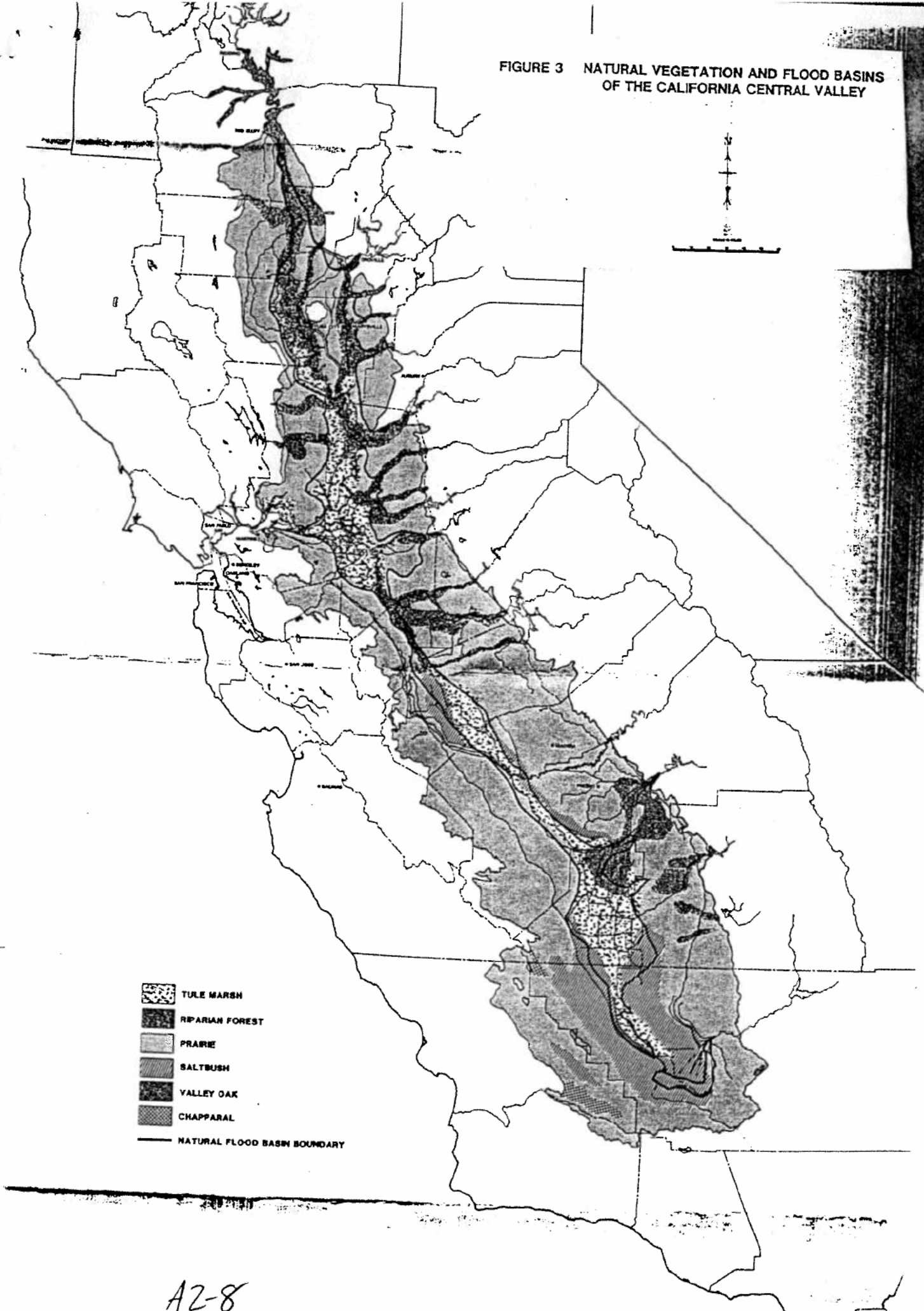
information on the San Joaquin Valley. The areal extent of this vegetation has also been mapped [Kuchler 1977; Roberts et al. 1977] and is shown on Figure 3.

These riverlands were more extensively altered by man than any other natural landscape in California [Bakker 1971], and they were one of the first major losses in the natural environment [Katibah 1984; Scott and Marquiss 1984]. Limited use of these forests probably occurred during the first settlement of the Valley around 1820 and slowly increased until the Gold Rush in 1849, when such use greatly accelerated [Katibah 1984]. Estimates based upon historic accounts indicate that 775,000 to 800,000 acres of riparian forest were present in the Sacramento Valley [Smith 1977; Roberts et al. 1977; Michny 1980] around 1850. By 1972, only 12,000 acres remained [Roberts et al. 1977].

Since the riparian forests were the only significant woody vegetation on the Valley floor, they were used by early settlers for fencing, lumber, and fuel [Thompson 1961]. Steamships transporting miners and supplies upriver were heavy users of local wood fuel. In the decades following the Gold Rush, many settlers turned to farming. This agricultural development began on the natural levees because they were higher and less subject to flooding [Scott and Marquiss 1984]. Most of these lands were converted to orchards and annual row crops [McGill 1975]. Additional losses of riparian forests were caused by streambank stabilization, channelization, gravel and gold mining, and grazing [Roberts et al. 1977; Warner 1984].

The removal of riparian vegetation from the riverlands significantly altered the hydrology of the Central Valley. It is well known that forests and brush reduce stream flow and decrease maximum daily discharge and normal flood peaks [e.g., Hoyt and Troxell 1932; Love 1955; Lewis 1968; Robinson 1952; Hibbert 1971; Turner and Skibitzke 1951]. Riparian vegetation is deep rooted and uses large quantities of water [Robinson 1958; Young and Blaney 1942]. The vegetative canopy

FIGURE 3 NATURAL VEGETATION AND FLOOD BASINS  
OF THE CALIFORNIA CENTRAL VALLEY



and understory also intercept precipitation, storing it for subsequent use and evaporation, thereby altering the seasonal distribution of runoff [Lewis 1968].

### **Natural Flood Basins and Tule Marsh**

The flood basins are shallow troughs that lie between the low plains and the natural levees along both sides of the Sacramento River and San Joaquin Rivers (Figure 2). They stretched from below Red Bluff on the Sacramento south to Bakersfield in the Tulare Lake Basin, and in wet years the entire Valley was a veritable inland sea. The early history of the Valley is rife with descriptions of the floods, starting with the great flood of 1805, which allegedly covered the entire Valley except the Sutter Buttes. The flood history of the Valley has been reviewed by several writers [Thompson 1960; Simpson and Meyer 1951; Gilbert 1879; Small 1929; Grunsky 1929].

The boundaries of these ancient flood plains (or overflowed lands, as they have often been called), are shown on Figure 3. These shallow flood basins were locally known as "tules" because of the heavy growth of tules (Spanish for reed), or rushes, which they supported [Bryan 1923, p. 39]. They were the lowest and flattest parts of the valley, they had no direct surface outlets, and they gently sloped toward the center and toward the downstream end, slowly draining into the main river channels after the flood wave had passed.

In times of ordinary high water, they were filled by overland flow that poured across the low plains in broad sheets and was trapped in the flood basins by the higher natural levees along the rivers. The basins were also filled by rivers that discharged into them either through definite channels or directly over natural levees. Many of the tributaries were not connected directly with the main rivers. They drained into the flood basins through a welter of channels, losing themselves "in the intricate plexus of sloughs which meander through the tule-land bordering the main river"

[Ransome 1896]. The hydrology of each individual flood basin is described elsewhere [Hall 1880; Bryan 1923; DPW 1931a; DPW 1931c; Davis et al. 1959; Grunsky 1929].

The existence of these flood basins was documented by early explorers and settlers [e.g., Gilbert 1879; Thompson 1960]. Fages, the first Spanish explorer to describe the Valley, wrote in 1773 that "it is all a labyrinth of lakes and tulares, and the River San Francisco (original name of the Sacramento and San Joaquin Rivers), divided into several branches winding in the middle of the plains, now enters and flows out of the lakes until very near to the place where it empties into the estuary of the river" [Bolton 1931]. Lieutenant Charles Wilkes, U.S.N., one of the first Americans to report on the Valley, wrote following an expedition in August and September 1841 that "according to the testimony of the Indians, the whole country was annually innundated" [Wilkes 1850, p. 189].

State Engineer Wm. Ham. Hall, in the first scientific treatise on the hydrology of the Valley, wrote that "in the natural state of the stream the waters of the Sacramento River, at time of ordinary flood, just overtopped the banks ...." Hall went on to define "ordinary flood" as that which "passes through the channel and over the low lands once, and perhaps twice, each winter or spring, except in seasons of drought, occurring once or twice every ten years" [Hall 1880, pps. 10-11].

Some of the flood waters that were captured in these basins seeped into the alluvial aquifers and natural levees, some drained directly back into the main channels, some was evapotranspired by the natural vegetation in the basins, and the balance was evaporated from the large surface area, many times that of present-day reservoirs. The precise distribution of these floodwaters is unknown. One estimate of drainage back into the stream channel was presented by DPW (1931b).

Since portions of these natural flood basins contained standing water and water-logged soils year-round (e.g., Grunsky 1929, p. 796; Bryan 1923), they were home to extensive areas of freshwater marshes. The estimated extent of the tule marshes is shown in Figure 3. As shown by this map, these marshes are sandwiched between the prairie and the riparian forest, and their outer limit approximately follows the natural flood basin boundaries throughout their range. Since these two boundaries were determined from different data sets and physical concepts [see DPW 1931a, 1931c; Kuchler 1964], it is striking how closely they match and is confirming evidence that both are reasonable estimates of natural conditions.

These marshes are probably the most neglected habitat type in California and have received scant botanical attention. Studies by botanists began with W.L. Jepson (1893, 1975). They have subsequently only been studied by Hoover (1935), Mason (1957), and more recently by the USGS [Atwater 1980; Atwater and Belknap 1980; Atwater et al. 1979]. The characteristic vegetation in these marshes included sedges, cattails, rushes, reeds, and other types of aquatic herbaceous vegetation [Mason 1957; Bakker 1971]. The common tule (*Scirpus acutus*), the cattail (*Typha latifolia*), and a variety of other *Scirpus* species were the most common plants [Hoover 1935; Atwater 1980].

The existence of these marshes is amply documented in writings of early explorers of the Central Valley, who described difficulties in getting their pack animals across the Central Valley due to the extensive marshlands (e.g., Farquhar 1932a, p. 118-119). The marshes are also shown on the maps prepared by the early explorers [reviewed by Landrum 1938] and on early maps prepared by the U.S. Department of Agriculture [Holmes et al. 1916] and the U.S. Geological Survey [Bryan 1923, Plate IV].

The evidence suggests that tule marshes were present year round, even during droughts. We reviewed diaries and correspondence from these early explorations and compiled (Table 1) eye witness descriptions of the tule marshes. We subsequently determined the year type (dry, normal, wet) from precipitation records [Anon. 1886; Graumlich 1987]. These analyses indicate that tule marshes were present throughout the Valley under all types of hydrologic conditions, including drought. Present day accounts also suggest that these marshes did not dry up. Bryan (1923), describing conditions observed during the dry period of 1912-13, wrote that, "In spite of the so-called Tule Canal, which traverses Yolo Basin ..., the basin contains some water even in the dry season..." (ibid., p.43).

The water supply for most of the freshwater marshes is believed to have been springs, groundwater, sloughs, and overflow from the main channels through breaks in the natural levies. Springs were common in the Valley under natural conditions. Assistant State Engineer Grunsky [Grunsky 1929 p. 793] reported that there were many places with "a large outflow in springs. These springs have a fairly constant flow throughout the year ...." In the Sacramento Valley, groundwater was within 1 foot of the surface in much of the area supporting marsh habitat. Elsewhere, where the marshes were underlain by clayey soils, they were probably supplied by sloughs that communicated with surface streams and/or groundwater. In the Delta, marshes had a constant, year-round water supply from groundwater discharge and drainage from upslope flood basins. Some riparian species in the Delta and lower Sacramento River have even been reported to grow much larger than elsewhere due to their abundant water supply [Jepson 1893], and remnant wetlands of the Delta today produce extraordinary amounts of organic matter [Atwater and Belknap 1980].

After the riparian forest, the natural flood basins (or tule lands), were developed next. These lands had been regarded as wastelands by early settlers, who avoided



TABLE 1  
EYE WITNESS ACCOUNTS OF TULE MARSH IN THE CENTRAL VALLEY

Observer/Date	Year Type <sup>a</sup>	Reference
<b>Sacramento Valley</b>		
April 1817		
Arguello	Dry	Cook (1960), p.276
March 1833		
John Work	Wet	Maloney (1945), p.35
September/October 1849		
Lt. Derby	Normal	Farquhar (1932a), p.252
<b>Delta Area</b>		
April 1772		
Fages	Normal	Treutlein (1972), p.335
August 1775		
Canizares	Dry	Eldredge (1909), p.65-69
April 1776		
Father Font	Dry	Bolton (1933), p. 388
October 1811		
Abella	Below Normal	Cook (1960), p.261
August 1837		
Vallejo	Above Normal	Cook (1962), p.190
September 1846/47(?)		
Bryant	Above Normal	Bryant (1967),p.300-301
<b>San Joaquin Valley</b>		
September 1806		
Moraga	Below Normal	Cutter (1950), p.101,125
September 1808		
Moraga	Below Normal	Ibid., p.124-125
August/October 1810		Ibid., p.157-158;
Moraga/Father Viader	Below Normal	Cook (1962), p.260
May 1817		
Father Duran	Dry	Chapman (1911), p.35
September 1846/47(?)		
Bryant	Above Normal	Bryant (1967), p.302
July 1853		Williamson (1855)
Lt. Williamson	Wet	p.10, 191-192
<b>Tulare Lake Basin</b>		
October 1814		
Father Cabot	Dry	Cutter (1950), p.205
September-November 1815		
Various observers	Dry	Cutter (1950), p.208-226
1849/1850		
J.W. Audubon	Normal/Wet	Audubon (1906), p.184
April/May 1850		
Lt. Derby	Wet	Farquhar (1932b), p.252

<sup>a</sup> For the period prior to 1850, Graumlich's (1987) data for the Southern Valleys is used, which included the Sacramento Valley. For the period 1850 to 1887, precipitation records at Sacramento (Anon. 1886) are used.

them due to the difficulties they presented — for not only was the terrain nearly impossible to cross, but recurrent outbreaks of "swamp fever" (or ague) claimed Indians and settlers alike. Thus, interest in reclaiming the swamps did not develop until after the 1850 Arkansas Act, in which the Federal government transferred ownership of all "swamp and overflowed lands" to the State on the condition that they be drained. California followed with a series of Acts and statutes, culminating in the 1868 Green Act, which created regular reclamation districts [Adams 1904].

Reclamation, even with the force of these Acts, was still painfully slow because it was technically difficult and costly, about \$5.00/acre [Tide Land Reclamation Co. 1869]. No coherent reclamation program ever developed, and the disorganized and senseless manner in which it was carried out was the scandal of the era [Manson 1888; Adams 1904]. Sherman Island in the Delta was one of the first successful reclamation projects [Tide Land Reclamation Co. 1869], and by 1884, 1,270 miles of levees had been built on the Sacramento and its tributaries and on the San Joaquin below the mouth of the Stanislaus [Grunsky cited in Manson 1884]. By 1910, 300,000 acres of land in the Valley were reclaimed and by 1918, this figure has risen to 700,000 acres [Karl 1979]. By 1920 to 1930, most of the Delta marshes were leveed and reclaimed for farming [Atwater et al. 1979; Thompson 1957, pp. 208-238].

This river levee program, however, was mostly unsuccessful in containing the flood waters [Manson 1884; Scott and Marquiss 1984]. The first plan for flood control in the Sacramento Valley was developed in 1880 [Hall 1880], but implementation was slow due to its great cost, complexity, and political controversy. With the federal government's involvement, the Sacramento Flood Control Project, the first in the U.S., was completed between 1928 and 1944. This massive project included 980 miles of levees; 7 weirs or control structures; 3 drainage pumping plants; 438 miles of channels and canals; 7 bypasses, 95 miles in length and encompassing an area of 101,000 acres; 5 low-water check dams; 31 bridges; and 50 miles of collecting canals

and seepage ditches [Karl 1079]. This massive public works project was followed by flood control features of the Central Valley Project in 1944. Nevertheless, flooding remains a concern in the Valley, and extensive damage occurred during the 1986 floods.

Leveeing the rivers and draining and reclaiming the marshes redistributed and increased freshwater inflow to San Francisco Bay. The natural flood basins and their marshes had provided extensive surface and subsurface storage for flood waters. The basins and marshes absorbed flood energy and reduced water velocities, partially explaining the absence of currents noted by early explorers [e.g., Bolton 1933, p. 369]. After the marshes were reclaimed and river levees constructed, flood flows that formerly spilled over the much lower natural levees were routed directly through the river channels into the Bay. This increased flood peaks [Grunsky 1929, p. 793], creating the now-famous "pulses", or high winter-spring discharges from the Delta that stratify most of the Bay. The quantity of water reaching the Bay was also increased because vegetation, which used copious quantities of water, was removed.

## **The Delta**

These flood basins included most of the Delta, which because of its unique features merits separate commentary. In its original condition, the Delta was a vast, flat water-soaked marsh, lying near sea level [Bryan 1923; Atwater et al. 1979; Dachnowski-Stokes 1936]. It was subject to periodic overflows at high stages of the rivers and was traversed by an ever-changing network of channels and sloughs that divided the marsh into islands.

As noted by Bryan (1923, p.44), "Under natural conditions these islands were covered with water throughout a large part of the year and were always flooded at high river stages. The tide raised and lowered the level of the water over large areas..." Most of these channels had natural levees that sloped away from the

channels towards the centers of the islands. Each island had a saucer-shaped surface and under natural conditions was swampy in the interior [Bryan 1923, p.10].

"Peat" and "muck" form the majority of the soils in the Delta and upstream areas, as mapped and defined by the U.S. Department of Agriculture [Nelson et al. 1918; Holmes et al. 1916; Cosby 1941]. These soils were very important in the natural hydrology of the basin [Dachnowski-Stokes 1935] because they could store water for subsequent use by native vegetation. The types of peat found in the Delta can absorb seven times their weight in water and have an absorptive capacity of 2.6 to 3 acre-feet of water per acre-foot of peat [Dachnowski-Stokes 1935, p.175].

## Plains and Prairie

The area stretching from the flood basins to the foothills, known locally as the plains (Figure 2), did not play as large a role in the natural hydrology as the riverlands and flood basins. These lands were sparsely vegetated with low water-using plants similar to present day vegetation. Thus, the role they played in the hydrology of the Valley is probably not very different today than under natural conditions.

The plains were smooth and nearly level lands that were formed as flood waters spread over them, leaving behind thin deposits of silt. The vegetation in the plains was prairie, as defined by Kuchler (1977) (Figure 3). The dominant species was bunchgrass (*Stipa pulchra*) [Barbour and Major 1977, p.495]. Numerous annuals and perennial grasses were associated with *Stipa* species, as listed in Barbour and Major, as well as plants with bulbs and annuals in the Compositae, Cruciferae, and other families. Hoover (1935), describing the San Joaquin Valley, noted that "one of the most striking features of the flora of the open plains of the valley in the primitive condition was the scarcity of grasses over large areas." Fremont, in his Memoirs, described the plains as "unbroken fields of yellow and orange colored flowers, varieties of *Layia* and *Escholtzia California*..." [Fremont 1964, p.18]. Some areas in

the plains, primarily north of the Delta, contained alkaline patches that supported saltbush (Figure 3).

The vegetation of the plains was swiftly altered, partly by accident, partly to accommodate grazing. Today, the herbaceous cover of the plains is dominated by annual plants, many of them introduced. In parts of the San Joaquin Valley, for instance, it has been found that more than half of the herbaceous cover is comprised of alien species, mainly from the Old World [Burcham 1957].

## Groundwater

The occurrence and depth to groundwater are important considerations in evaluating the natural hydrology of the Central Valley. The tule marshes would have required vast areas of water-logged soils and standing water for most of the year, and the riparian forest would have required groundwater within reach of their root systems. Our examination of the available data indicates that the riparian forest's water supply was stream flow, bank storage in the natural levees, and groundwaters. The marshes, on the other hand, were located in areas where the groundwater table was at the surface, in areas underlain by clayey soils that were supplied by sloughs, or in areas that were tidally inundated year round (the Delta). Our calculations indicate that enough water to supply the marshes was stored annually in surface soil horizons. Additional water was supplied from streams via sloughs.

Studies on groundwater hydrology of the Central Valley were reviewed recently [Page 1986]. The earliest studies were conducted by the U.S. Geological Survey between 1905 and 1913 [Bryan 1923; Mendenhall et al. 1916]. We focus on these early studies, since significant pumping for irrigation was present during later work [e.g., Olmsted and Davis 1961; Davis et al. 1959].

Under natural conditions in the Valley, groundwater aquifers were filled by precipitation falling on the foothills and plains and by flood waters that filled the natural flood basins flanking the main channels. Originally, "there (was) no adequate outlet for ground waters of the Great Valley..." [Mendenhall et al. 1916, p.28] so they escaped by "capillarity" and evaporation along the valley axis [Mendenhall et al. 1916; Bryan 1923, p.85; Hilgard 1892]. This water slowly moved downslope toward the main channels, stagnating in the valley trough. It discharged "into seeps and sloughs in the basin lands where the water evaporated; by evaporation from moist lands where the groundwater stands less than about 8 feet from the surface; and by transpiration where the groundwater is within reach of the root of plants" [Bryan 1923, p.85], forming alkali deposits.

The areas that supported marshes in the Valley were and are bordered by patches of alkaline soils in most areas. These patches delineate the areas within which groundwaters used to emerge at the surface where the marshes were located. The origin, composition, and location of these salt deposits are presented elsewhere [Hilgard 1892; Kuchler 1977; Holmes et al. 1916; Nelson et al. 1918; Bryan 1923, p.85]. These areas supported saltbush, and the largest concentration of such regions was located in the San Joaquin and Tulare Lake basins (Figure 3). These deposits are greater in extent in the San Joaquin valley because the higher precipitation to the north continuously washed the deposits away in most areas [Bryan 1923, p.86].

Bryan (1923), in his classic work on groundwater conditions in the Sacramento Valley, reported that it was "remarkable for the large area in which the water table stands close to the surface. During the summers of 1912 and 1913 — two dry years — the depth to water in more than 80 per cent of the valley was less than 25 feet. " (ibid. p.82).

In describing the location of groundwater in the flood basins, Bryan (1923) goes on to report that in dry years, over large parts of the American, Sutter, and Yolo flood basins and adjacent riverlands, that the depth to water "ranges from a maximum of 20 feet along the river bank [where the riparian forest was] to only a few inches in parts of the basins [where the marshes were]. In the basins, the maximum depth is 6 feet in the very driest years." (ibid, p. 83).

## **FRESHWATER INFLOW TO THE BAY**

We have calculated the freshwater inflow to San Francisco Bay from a water balance around the portion of the Central Valley that drains into the Bay. The geographic boundary and areas used in our analysis are shown on Figure 4. The portion of the Central Valley that drains into the Bay is Area 2, which comprises the Sacramento Valley (Area 2a), the Delta and upslope areas (Area 2b), and the San Joaquin Valley (Area 2c). These boundaries are the same as used by the DWR in their unimpaired flow studies [DWR 1987].

The water balance we performed around the Central Valley can be expressed as follows:

$$\text{Delta Outflow} = \text{Water Supply} - \text{Water Use by Native Vegetation}$$

The total water supply is equal to the sum of unimpaired rim inflows, Tulare Lake Basin overflow, and precipitation on the valley floor. We have not included evaporative losses from flooded areas because most of these areas supported native vegetation. Evaporative water losses from flooded areas with no vegetation are probably small. We have also assumed that over the long term, the net change in basin storage (groundwater, bank storage, natural flood basins, marshes) is zero. Any water that was stored during one season would subsequently be used by native

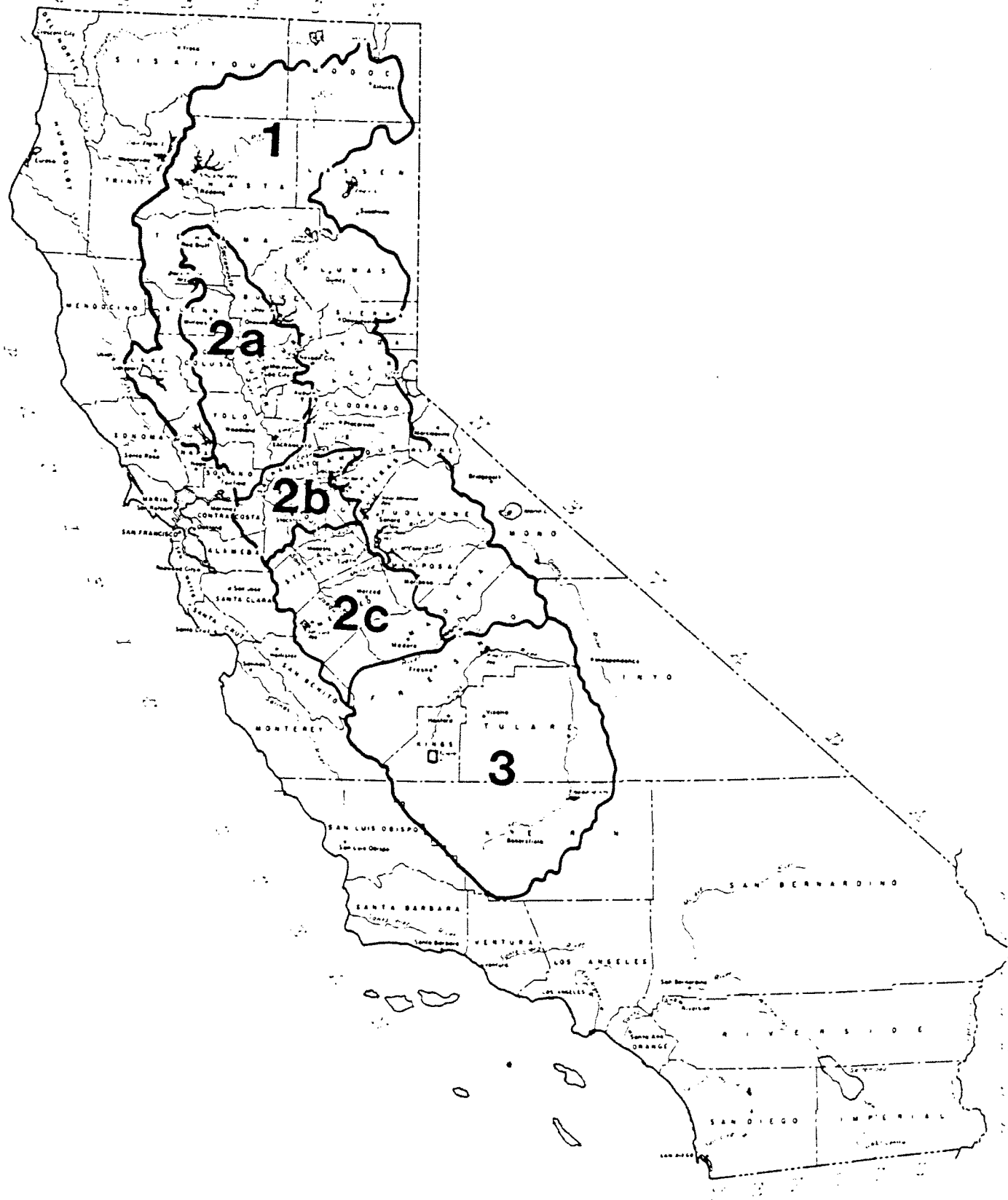


FIGURE 4. Hydrologic Units Used in Calculating Freshwater Inflow to San Francisco Bay Under Natural Conditions.



vegetation or would be released at a later time as channel flow. Our calculations are for long-term, average annual conditions.

The results of our water balance are presented in Table 2. Each element of the water balance (first column) is described and discussed in subsequent sections. This table shows the quantity of water from each source (rim inflow, Tulare Lake Basin inflow, valley floor precipitation) and the amount used by each principal type of vegetation in the Valley. We have used a range for vegetative water use because the consumptive use would have varied in different parts of the Valley.

This table shows that under natural conditions, an average of 38.8 million acre feet of water were available each year. From 51 to 80 percent of this supply was consumptively used by native vegetation and the balance entered San Francisco Bay. Slightly more than one-third of the water was evapotranspired by the riparian forests that lined all of the major streams. The balance was used by tule marshes in the natural flood basins and by prairie vegetation, in the expansive plains. The remaining 7.8 to 18.9 million acre feet annually flowed through the Delta into San Francisco Bay.

Our estimates of net water use and Delta outflow under natural conditions are compared with equivalent quantities for the "unimpaired" case and the 1990 level of development on Figure 5. Our estimates of natural net water use on this figure are the mid-points of the ranges presented in Table 2. "Unimpaired" flows are those calculated by the DWR in Exhibit 26 [DWR 1987]. These flows assume present channel configurations, no diversions, or exports, and no tule marsh or riparian forest water use. They assume that the natural flood basins and their marshes have been drained, that levees and channel bypasses are in place, and that the Valley water supply and runoff have the same characteristics as foothill areas. Although these unimpaired flows certainly never existed, their magnitude may have been

TABLE 2

FRESHWATER INFLOW TO SAN FRANCISCO BAY  
CALCULATED FROM A WATER BALANCE AROUND THE CENTRAL VALLEY

Element in Water Balance	Long-term Average Annual Water (millions of ac-ft/yr)
<b>Water Supply</b>	
Unimpaired Rim Inflow	28.2
Tulare Lake Basin Inflow	0.2
Precipitation on Valley Floor	10.5
<b>Total</b>	<b>38.8</b>
<b>Water Use by Native Vegetation</b>	
Riparian Forest	8.6 - 11.5
Tule Marsh	5.7 - 8.5
Prairie	5.6 - 11.0
<b>Total</b>	<b>19.9 - 31.0</b>
Freshwater Inflow to San Francisco Bay under Natural Conditions	7.8 - 18.9

4.3 5.8

12.1 - 24.7

4/3/50

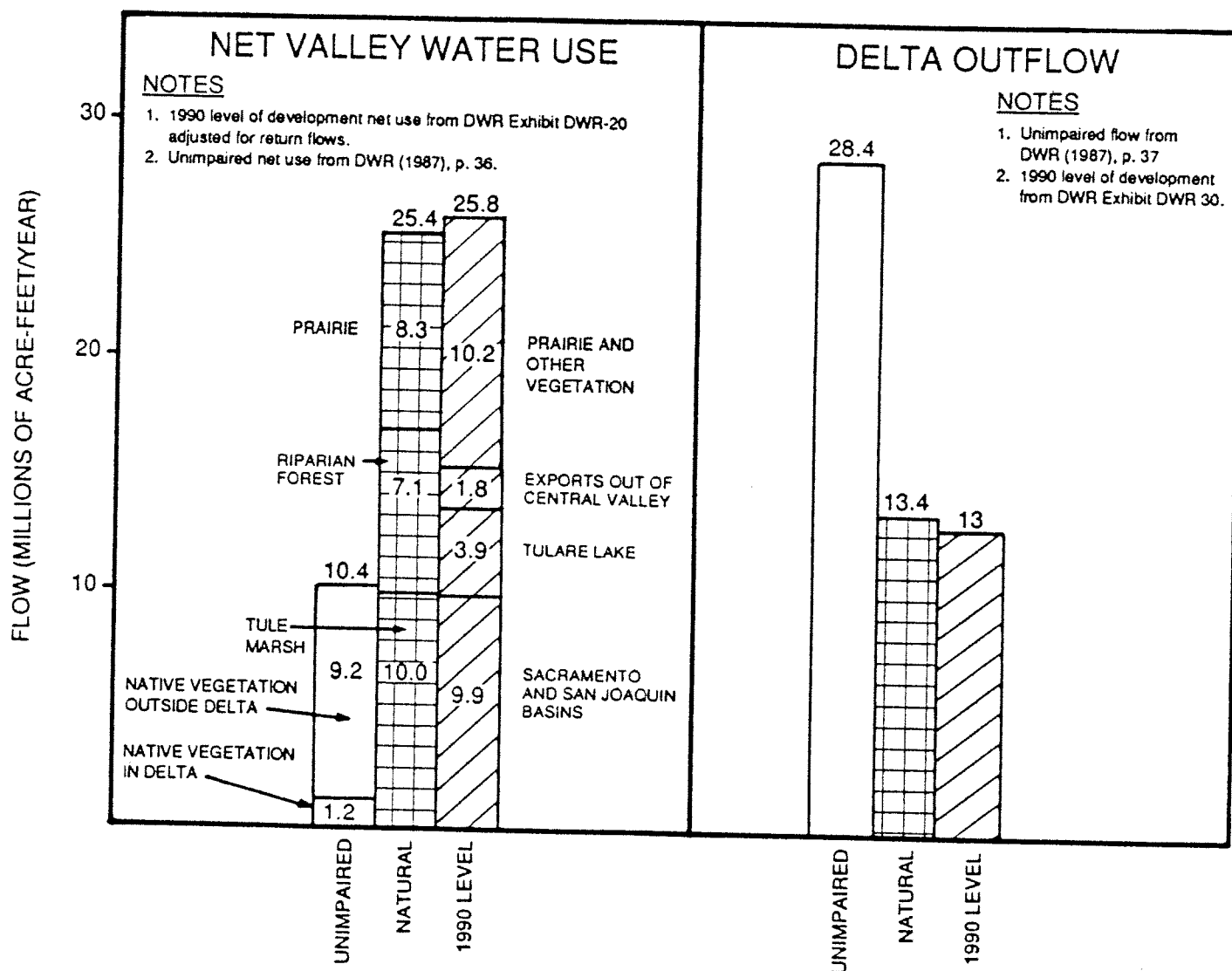


FIGURE 5. Comparison of Unimpaired, Natural, and 1990-Level-of-Development Net Water Use and Delta Outflow.

approached sometime between 1850 and 1900 (Figure 1). Considerable additional work is required to determine what the maximum outflow may have been and when it would have occurred.

Figure 5 indicates that evaporative water losses from the original marshes and riparian forests (17.1 million ac-ft/yr) were about 10 percent greater than present in-basin use and exports (15.6 million ac-ft/yr). This means that more water was used under natural conditions in the Central Valley than is used in this area today. During the first half century of California's statehood, the water supply and river flows were increased by removing the riparian forests, draining the swamps, and channelizing the streams. During the second half century, this increased supply was developed for agricultural and domestic use (Figure 1).

Figure 5 also shows that Delta outflow today is very close to what we estimate it was under natural conditions. Our calculations indicate that Delta outflow was 7.8 to 18.9 million ac-ft/yr under natural conditions, while the DWR has estimated that Delta outflow for the 1990 level of development will be 13 million ac-ft/yr [DWR Exhibit No. 30, D1485 Delta Standards], well within our range.

The following sections present the data and assumptions used to calculate the water balance discussed above.

### **Rim Inflows**

Rim inflows are the total quantity of water from Area 1 (Figure 4) under natural conditions. They were calculated from DWR's unimpaired flow data [DWR 1987] by subtracting valley floor contributions [DWR Areas 1,12,24,17,23] from total Delta inflow (ibid., p. 35).

## **Land Areas**

Land areas were used in a number of calculations in this work. All of the relevant areas used in our calculations are summarized in Table 3. Areas are also outlined on the map shown in Figure 3.

## **Flood Basins**

The flood basin areas were used to calculate active groundwater storage capacity and as a rough check on the accuracy of tule marsh acreages. These areas were determined by planimetering from maps reported in DPW Bulletin 26 and 29 [DPW 1931a, 1931c] that were prepared from surveys and maps by State Engineer Wm. Ham. Hall (1880). Our estimates indicate that about 3.1 million acres of land were subject to annual inundation and that about 2.2 million acres of this was tributary to the Bay. However, even larger areas, extending into the plains, were inundated in wet years [Hall 1880, p. 8]. Our flood basin areas include the channel areas and natural levee areas, which were usually higher than the flood water level. Channel surface areas are also summarized in Table 3 from the early literature.

## **Tule Marsh**

We planimetered the tule marsh area from Kuchler's natural vegetation map (1977), correcting it for areas that others have reported as riparian forest [Thomas et al. 1977]. These estimates indicate that there were 1.6 million acres of tule marsh in the Central Valley, and about 1 million acres were tributary to the Bay. These estimates generally compare favorably with those cited in literature prior to 1900. For example, Manson, one of Ham. Hall's assistants, wrote in 1884 that swamp lands situated on the lower San Joaquin and Sacramento rivers and their tributaries, including the Delta, encompassed about 1 million acres [Manson 1884, p. 88].

TABLE 3  
LAND AREAS

Drainage Basin (Figure 4)	Total Area (1,000 acres)						Total Valley Floor <sup>j</sup>
	Flood Basin Area <sup>a</sup>	Channel Surface Area	Riparian Forest <sup>f</sup>	Tule Marsh <sup>g</sup>	Prairie <sup>h</sup>	Salt- Bush <sup>h</sup>	
Sacramento Basin (2a)	1,256	24 <sup>b</sup>	938	295	2,256	0	3,489
Delta (2b)	588	37 <sup>c</sup>	198	397	700	0	1,295
San Joaquin Basin (2c)	345	7 <sup>d</sup>	298	254	2,392	148	3,092
Tulare Basin (3)	936	3 <sup>e</sup>	515	643 <sup>j</sup>	4,027	1,298	6,503

<sup>a</sup> Determined by planimetering the overflowed land area from Plate LXXIII [DPW 1931c] and Plate VII [DPW 1931a]. This area includes channel surface area and natural levees.

<sup>b</sup> From Hall (1880), p. 7. May include some channels in northern Delta.

<sup>c</sup> From DPW (1931b), p. 70, notes to table.

<sup>d</sup> Estimated by multiply channel area in Sacramento Basin by the ratio of the unimpaired flow from the San Joaquin Basin (6861 TAF) to that from the Sacramento Basin (24,800 TAF) for the period 1889-1929 [DPW 1931a, Table 5; DPW 1931c, Table 5].

<sup>e</sup> Estimated as in (d), but using unimpaired flow of Tulare Basin for 1889-1929 (3,510 TAF).

<sup>f</sup> Planimetered from Kuchler (1977) and Roberts et al. (1977). Kuchler was used for forest along tributaries and for all areas south of the Merced River while Roberts was used for forest along the main channels (Sacramento, San Joaquin Rivers).

<sup>g</sup> Planimetered from Kuchler (1977). Areas corrected for riparian forest along main channels as shown by Roberts et al. (1977).

<sup>h</sup> Planimetered from Kuchler (1977).

<sup>i</sup> Planimetered from Kuchler (1977). Corresponds to boundary defined by Blue Oak-Digger Pine forest and California Prairie (*Stipa* spp.). This area is the sum of riparian forest, tule marsh, prairie, and saltbush in all basins except Tulare. The Tulare Lake Basin has small quantities of other types of native vegetation that we did not consider here.

<sup>j</sup> Under natural conditions, the Tulare Valley contained a series of lakes interconnected by sloughs. The marsh and lake area varied greatly, according to historical accounts. This area is assumed to about equal the sum of marsh plus lake under average conditions.

## **Riparian Forest**

Our riparian forest area was determined by planimetering from Robert's (1977) and Kuchler's (1977) natural vegetation maps. We used Roberts for forest areas along the main river channels (Sacramento, San Joaquin Rivers), which Kuchler showed incorrectly as tule marsh. We used Kuchler for forest along tributary streams, which Roberts underestimated by restricting the habitat to Columbia and Hanford loam soils. Our estimates indicate that there were about 1.9 million acres of riparian forest in the Central Valley, and 1.4 million acres of this were tributary to the Bay. Our estimates compare favorably with early estimates [Smith 1977; Michny 1980] but are high compared to present-day estimates derived from soil profiles. Katibah (1984) estimated that there were 921,600 acres of riparian forests in the Central Valley, and Roberts et al. (1977) estimated that there were some 771,600 acres north of the Merced River. In both cases, the forests were mapped according to soil profiles and were restricted to loams.

## **Precipitation on the Valley Floor**

Precipitation falling on the valley floor was calculated by multiplying the area of the valley floor (Table 3) by the area-weighted average annual precipitation in feet/year. The valley floor precipitation volume for each basin (2a,2b,2c) is presented in Table 4, and the precipitation is listed in footnote (b) to that table.

The valley floor areas that we used in our calculations were obtained by planimetering from Kuchler's (1977) Natural Vegetation Map the area defined by the boundary between blue oak-digger pine forest and prairie. The area-weighted precipitation values that we used for each area (Areas 2a,2b,2c) were obtained from Schreiner (1987). They were calculated by planimetering from the annual average isohyetal precipitation map for the Central Valley for the period 1911-1960 prepared by J.D. Goodrich. The total basin areas used in these calculations were those used

TABLE 4  
ELEMENTS OF WATER USE AND WATER SUPPLY BY BASIN

Basin	Natural Vegetation Water Use (1,000 ac-ft/yr) <sup>a</sup>				Valley Floor Precipitation <sup>b</sup> (1,000 ac-ft/yr)
	Riparian Forest	Tule Marsh	Prairie		
			Grasslands	Saltbush	
Sacramento Valley (2a)	5,628 – 7,504	1,770 – 2,655	2,256 – 4,512	0	5,902
Delta Valley (2b)	1,188 – 1,584	2,382 – 3,573	700 – 1,400	0	1,640
San Joaquin Valley (2c)	1,788 – 2,384	1,524 – 2,286	2,392 – 4,784	296	2,937
Totals	8,604 – 11,472	5,676 – 8,514	5,348 – 10,696	296	10,479

<sup>a</sup> Water use was calculated by multiplying the total land area from Table 3 by the water use. The water use used in the calculations is as follows: riparian forest: 6 to 8 ac-ft/ac; tule marsh: 6 to 9 ac-ft/ac; grasslands: 1 ac-ft/ac; saltbush: 2 ac-ft/ac.

<sup>b</sup> Precipitation was calculated by multiplying the total valley floor area from Table 3 by the area-weighted average precipitation for the period 1911-60 from J.D. Goodrich's (1966) isohyetal map for the Central Valley [Schreiner 1987]. The precipitation values are; Sacramento Valley - 20.3 in.; Delta area - 15.2 in.; San Joaquin Valley - 11.4 in.



by DWR in its consumptive use studies. These precipitation estimates include some foothill areas where precipitation is higher than on the valley floor. Therefore, our average precipitation values (Table 4) are slightly (<5 percent) larger than actual precipitation falling on the valley floor area. This would slightly overestimate natural Delta outflow.

### **Water Use by Native Vegetation**

Water used by native vegetation was estimated by multiplying the area of each type of vegetation by a consumptive use value [Blaney 1954; Jensen 1973]. The areas that we used in these calculations were summarized in Table 3. The resulting water use for each type of vegetation by basin was summarized in Table 4.

This section discusses the consumptive use factors we used to estimate native vegetative water use. Normally, riparian forests and aquatic macrophytes transpire at the so-called potential rate due to the fact that their roots are continuously immersed in water. However, prairie grasses depend upon available soil moisture, and their actual evapotranspiration was probably less than the potential amount. Thus, we have selected potential evapotranspiration factors (ET) for wetland vegetation and actual (field) values for prairie vegetation.

### **Riparian Forest**

The consumptive use of water by riparian vegetation has been determined in studies designed to save water by removing phreatophytes from along streams and canals in arid areas [e.g., Muckel 1966; Robinson 1952; Blaney 1956]. Most relevant studies have been reviewed and summarized elsewhere [Robinson 1958; Young and Blaney 1942]. Water use estimates for the principal types of vegetation occurring in Central Valley riparian forests are summarized in Table 5.

TABLE 5  
WATER USE BY COMMON RIPARIAN VEGETATION IN THE  
CENTRAL VALLEY

Vegetation	Annual Water Use (ac-ft/ac)	Location	Reference
<b>Field Studies</b>			
Canyon-bottom	7.5 <sup>a</sup>	Coldwater Canyon, CA	Blaney (1933)
Moist-land vegetation	9.4 <sup>b</sup>	Temescal Canyon, CA	Blaney et al. (1930)
River-bottom brush	4.2	Prado, CA	White (1932)
<b>Tank Studies</b>			
Willows	4.4	Santa Ana, CA	Blaney et al. (1930)
Willows	2.9	Not reported	DPW (1931b)
Cottonwoods	5.2 – 7.7 <sup>c</sup>	San Luis Rey, CA	Blaney (1957, 1961)
Alders	5.0	Santa Ana, CA	Muckel (1966)
Cottonwoods	7.6 <sup>c</sup>	Safford Valley, AZ	Gatewood et al. (1950)

<sup>a</sup> Reported for the 4-month period July-October 1932 and converted to a 12-month basis using the monthly distribution of water use reported for willows (DPW 1931b).

<sup>b</sup> Reported for the month of May 1929 and converted to a 12-month basis using the monthly distribution of water use for willows [DPW 1931b].

<sup>c</sup> Range depends on depth to groundwater, which varied from 3 to 4 feet at San Luis Rey and was 7 feet at Safford Valley.

In our estimates of evaporative water losses from riparian forests, we used an evapotranspiration (ET) range of 6 to 8 ac-ft/ac. The lower limit was calculated by weighting the water use for willows (4.4 ac-ft/ac), cottonwoods (7.7 ac-ft/ac), and river-bottom brush (4.2 ac-ft/ac) by the relative densities reported by Conrad et al. (1977) for a riparian forest along the Sacramento River (cottonwood=0.44; willows=0.20; all other=0.36). These densities are generally consistent with abundances reported by others [e.g. Warner 1984]. Our upper limit of 8 ac-ft/ac is the average of field measurements made for canyon-bottom and moist-land vegetation (Table 5).

### **Tule Marsh**

Investigations on the consumptive use of water by aquatic macrophytes have been conducted for nearly a century, yielding a variety of contradictory results. Initially, studies were conducted in isolated tanks, which yielded rates that were up to 300 percent higher than evaporation from a free water surface [Otis 1914]. Later, it was learned that it was important to surround the tanks with similar vegetation to simulate the environment in large swampy areas [Young and Blaney 1942, p.25]. This reduced evaporation due to the insulation from surrounding vegetation.

Several other factors are now recognized as affecting water use by marsh vegetation. Canopy surface geometry (i.e., the actual surface from which water evaporates) plays an important role in evaporation from marshes. Generally, small or narrow canopies such as occur along rivers, streams, canals, and sloughs can have evaporative water losses several times greater than those from comparable open water surfaces [Blaney 1961, p.39; Anderson and Idso 1987, p. 1041]. Evaporative losses from extensive vegetative canopies such as occur in large marshes are much lower, depending upon a number of other factors, including humidity, winds, length of growing season, depth of water, age of plants, and height of canopy. Evaporative water losses from tall canopies, which are characteristic of tule marsh areas (tules

and other marsh vegetation typically grow to 5 - 6 feet), are enhanced by atmospheric turbulence. A recent study reported that "evaporative water loss from a tall canopy such as cattails (*Typha latifolia*) may be as much as 40 percent greater than that from a comparable open water surface." (ibid, p. 1041). Reliable measurements of up to 90 percent greater than from a free water surface have been reported for tule marsh in California [Young and Blaney 1942; Young 1938].

We reviewed measurements of water use by tules and cattails in marsh environments similar to those of the Central Valley, and the relevant values are summarized in Table 6. Most of these values were measured in tanks (i.e., lysimeters) that were properly surrounded by native vegetation. We eliminated literature values with the following characteristics: (a) less than 12 months of data were reported; (b) abnormal growth or other anomalous conditions were described; (c) salt-water marsh (high salinity reduces evaporation).

From Table 6 and the additional considerations we summarize here, we have selected a range of 6 to 9 ac-ft/yr for tule marsh water use. The lower end of the range is probably representative of areas with lower evaporation rates (e.g., northern Sacramento Valley) and areas that lacked a full year-round water supply (i.e., probably only in Tulare Lake Basin). The upper end of the range applies to areas with a high evaporation rate (e.g., parts of Delta, San Joaquin Valley) and a full year-round supply of water (e.g., the Delta).

Our range of 6 to 9 ac-ft/ac was derived from the ratio between marsh evapotranspiration and pan evaporation first published by Young [Young 1938; Young and Blaney 1942; Anderson and Idso 1987]. The ratio of tule and cattail evapotranspiration to pan evaporation is about 1.4 and can be as high as 1.9. Since pan evaporation in the Central Valley ranges from about 5.0 to 6.5 ac-ft/ac [DWR 1979], the corresponding marsh evaporation would be 7 to 9 ac-ft/ac, which is well

TABLE 6  
WATER USE BY TULES AND CATTAILS

Location	Type of Marsh	Annual Water Use (ac-ft/ac) <sup>d</sup>	Reference
King Island, Delta	freshwater tidal marsh	7.4 - 13.0 <sup>a</sup>	Stout (1929-35)
Victorville, CA (Mojave River)	desert inland marsh	6.5 - 7.0	Young and Blaney (1942)
Mesilla Valley, NM (Rio Grande River)	freshwater marsh	10.1	Young and Blaney (1942)
Bonner's Ferry, ID	inland marsh	5.1	Robinson (1952)
Antioch, Delta	freshwater (?) tidal marsh	5.8 <sup>b</sup>	Blaney and Muckel (1955)
Clarksburg, Delta	freshwater tidal marsh	9.6 <sup>c</sup>	DPW (1931b)

- <sup>a</sup> Value for third year of growth. Range corresponds to two different tank configurations.
- <sup>b</sup> Calculated based on limited experiments at Joice Island in Suisun Marsh.
- <sup>c</sup> Experiments conducted in isolated tanks and values adjusted by multiplying by a factor of about 0.5.
- <sup>d</sup> All values measured in tank experiments in which tanks were set in natural environment unless otherwise stated.

within the range of reported evapotranspiration values (Table 6). We lowered the minimum to 6 ac-ft/ac because several of the reported values (Table 6) are around 6 ac-ft/ac.

We believe that this range is conservative and may understate the actual water use in natural Central Valley marshes. Many of the marshes in the Central Valley were supplied by sloughs, as discussed previously. The Delta, in particular, had some 37,000 acres of sloughs, and the extensive tule marsh south of the Merced River was a complex maze of sloughs. Water use by marsh vegetation growing along sloughs can be several times higher than by those growing deep within an expansive marsh [Blaney 1961, p.39; Anderson and Idso 1987, p.1041]. Actual measurements with tules and cattails suggest that water use in these fringe areas is about 20 ac-ft/ac [Young and Blaney 1942]. We have made no effort to estimate these edge effects, but they could be significant in marshes that are fed by sloughs.

## Prairie

The majority of the land area in the Central Valley plains was formerly prairie (Table 3), and it initially supported a vigorous livestock industry [Burcham 1956]. Today, much of it is farmed. As discussed previously, this area was covered with a bunchgrass (*Stipa* spp.) community that included many forbs. The more alkaline soils in the Valley, located in area of groundwater discharge, supported saltbush [Kuchler 1977; Barbour and Major 1977].

We reviewed measurements of water use by vegetation similar to that occurring in the Central Valley prairie. Relevant values are summarized from the literature in Table 7. This table indicates that native prairie uses from 0.8 to 1.8 ac-ft/ac of water, or about 1.3 ac-ft/ac on the average. Saltgrass, which was common in the Valley [Barbour and Major 1977] can use larger quantities of water, up to 5 ac-ft/ac

TABLE 7  
WATER USE BY NATURAL VEGETATION COMMON IN THE  
CENTRAL VALLEY PRAIRIE

Vegetation	Annual Water Use	Location	Reference
<b>Field Studies</b>			
Native brush	1.4 - 1.8	San Bernadino, CA	Young and Blaney (1942)
Native brush	1.5	Muscoy, CA	Young and Blaney (1942)
Native brush	1.2	Claremont, CA	Young and Blaney (1942)
Native brush	1.6	Palmer Canyon, CA	Young and Blaney (1942)
Native grass and weeds	0.8	San Bernadino, CA	Young and Blaney (1942)
Native grass and weeds	1.2	Cucamonga, CA	Young and Blaney (1942)
Native grass and weeds	1.0	Anaheim, CA	Young and Blaney (1942)
Native grass and weeds	1.1	Ontario, CA	Young and Blaney (1942)
Native grass and weeds	1.1	Wineville, CA	Young and Blaney (1942)
Saltgrass	2.1	Owens Valley, CA	Lee (1912)
Annual grasses, forbes, and legumes	1.2	Placer County, CA	Lewis (1968)
<b>Tank Studies</b>			
Saltgrass	1.1 - 3.6	Santa Ana, CA	Young and Blaney (1941)
Saltgrass	1.1 - 4.1	Owens Valley, CA	Young and Blaney (1942)
Saltgrass	2.6	Isleta, NM	Young and Blaney (1942)
Saltgrass	0.8 - 4.0	Los Griegos, NM	Young and Blaney (1942)
Annual grasses	0.8 - 1.2	Placer County, CA	Lewis (1968)
Grass	1.2	San Luis Rey, CA	Blaney (1957)
Grasslands	0.9 - 2.9	Sierra Ancha, AZ	Rich (1951)
Grasses	2.2	Sierra Ancha, AZ	Rich (1951)

[Robinson 1958]. In our analyses, we used a range of 1 to 2 ac-ft/ac for all prairie as defined by Kuchler (1977).

About 148,000 acres of saltbush (*Atriplex polycarpa*) were also present in the plains region of the San Joaquin Valley. Since we did not find water use measurements for this species, we used the mean consumptive use value (2 ac-ft/ac) determined for saltgrass (Table 7).

### Native Vegetation Water Supply

The natural water supply that we described in the section, The Natural Landscape, could have supported the native vegetation that we have described. In the Sacramento valley, we believe that the principal water supply to marshes and riparian forests was a high groundwater table, springs, and bank storage. In the San Joaquin valley, the principal supply for the marshes was groundwater that was discharged through sloughs and springs.

The riparian forests were located on the permeable natural levees where channel seepage was continuously present and groundwater was within 20 feet of the surface. The predominant riparian forest species (i.e., cottonwoods, willows) have typical rooting depths of 15 to 30 feet [Robinson 1958, p.62,64], and valley oak, which were common in other areas, are known to draw water from depths in excess of 40 feet [Lewis and Burgy 1964].

Tules and other marsh vegetation, on the other hand, have shallow root systems, typically in the form of rhizomes [Jepson 1975; Mason 1957; Correll and Correll 1972; Beetle 1941]. The common cattail is reported to extend its rhizomes over a diameter of 10 feet in a single growing season and to produce aerial shoots 4 to 48 inches long (Yeo 1964). These plants probably only grew in areas where the groundwater table was within 5 feet of the surface or in regions with a surface water



supply (i.e., via sloughs or springs). An examination of early maps reveals that marshes were located in areas where the groundwater table was at the surface and where soils were reported to have high absorptive capacities [e.g., Forbes 1931, Plate B-I]. Areas underlain by clayey soils that supported tule marsh were typically criss-crossed by complex assemblages of sloughs [e.g., see Bryan 1923, Plate IV; Holmes et al. 1916, Soil Map; Mendenhall et al. 1916, Plate I].

Under natural conditions, surface storage in the flood basins and groundwater storage in the underlying aquifers probably operated in concert to supply native vegetation. Today, this is practiced by spreading water on the land to recharge aquifers and is known as "conjunctive use" [DWR 1983, p.77]. Water was stored during wet periods and used during dry periods.

We investigated the potential groundwater available for native vegetation in each basin (Figure 4, Areas 2a, 2b, 2c) and found that enough water was present in storage in the top 10 feet of soil beneath the flood basins to support marshes using up to 9 ac-ft/ac of water for at least one year everywhere except in the San Joaquin Basin. There, groundwater was adequate to only support marshes at a rate of 6 ac-ft/ac. However, we believe that groundwater storage was not the sole source of water for any of the marshes. The sloughs, which were typically deeper than the main channels, and springs could also have transported surface waters into the marsh areas. Additionally, some flood water from the Sacramento River moved into the San Joaquin Valley through Delta sloughs (e.g., DPW 1931b).

### **Tulare Lake Basin Overflow**

Under natural conditions, and through the present, water was and is exchanged between the Tulare Lake Basin (Area 3, Figure 4) and the San Joaquin Basin (Area 2c) during flood flows. Most people currently believe that the flow was from the Tulare Lake Basin into the San Joaquin Basin and hence into the Bay, because that

is the direction of flow today. Many early maps of the Valley show a continuous ribbon of water running from the Delta south to the lakes of the Tulare Basin [Landrum 1938]. Fremont remarked that the Tulare lakes and the San Joaquin River in the rainy season made a "continuous stream from the head of the valley to the bay." [Fremont 1964,p.14]. However, the amount of water passing across this boundary and the direction of flow are subject to considerable conjecture.

We used DWR's estimate of the Tulare Lake Basin overflow [DWR 1987, p.33] in our natural flow calculations (Table 2). This value (174 TAF/yr) is actually the historic USGS flow measurements at James Bypass on the Fresno Slough, which connects the two drainages. These flows probably have little, if any relationship to flows that may have occurred under natural conditions.

Our calculations suggest that over the long-term, the net water exchange between the two basins was nearly zero. Drought was more common in the Tulare Lake Basin than to the north, and these lakes were often reported as dry by early explorers. Under many conditions, water moved from the San Joaquin Basin into the Tulare Lake Basin, or in the opposite direction. Nevertheless, we adopt DWR's estimate in an effort to be conservative. We reviewed the literature in an attempt to resolve the uncertainty surrounding this overflow. We also calculated a water balance for the Tulare Lake Basin. This work indicates that the long-term net exchange of water between these basins was about equal to zero.

### **Natural Geography and Hydrology**

The San Joaquin and Tulare Lake drainage basins are separated by a natural ridge or barrier that lies immediately to the south of the San Joaquin River. Tulare, Kern, Buena Vista, and other small lakes were located in a depression south of this ridge. Normally, the San Joaquin River system drains north into the Bay, and the Tulare system drained south into these lakes. The lakes were connected by sloughs and

formerly were filled by flow from the east-side tributaries, primarily the Kings and Kern Rivers. These lakes no longer exist because they were drained and reclaimed for farming. The overflow area was and remains a complex network of sloughs, the principal one being Fresno Slough.

The overflow lands bordering the slough were of nearly uniform width, averaging about 5.4 miles [Davis et al. 1959, p. 28]. The slough itself, under natural conditions, has been reported to be "like a canal...and very deep near the San Joaquin, but eight to ten miles from this river it divides up into numerous channels, which become intricate and ramified as they enter the lake." [Williamson 1853, p.192]. It was "about forty miles in length...and about two hundred and forty feet in width...." in April 1850 [Farquhar 1932b], a very wet year in the Valley [Anonym. 1886].

Under natural conditions, the Kings River discharged into this lowland area. Part of the flow moved south to Tulare Lake, which formerly covered an area varying from a few square miles in dry years to about 760 square miles in wet ones [DPW 1931c, p.76]. Part may also have moved north through Fresno Slough into the San Joaquin Basin under some conditions. Apparently, the flood waters had to raise the surface of the lake to an elevation of 205 to 210 feet from a low of 176 feet before any water moved northward into Fresno Slough and the San Joaquin River (ibid., p.483).

### **Historic Accounts**

Contemporary technical descriptions generally indicate that transfer of water only occurred during periods of high flow in winter and spring and that there was no constant flow direction, the flow sometimes being south and sometimes north. In the earliest technical description of note, Coulter, an English scientist, reported that "The Tule Lakes are now known not to exceed 100 miles in total length, being fordable in the dry season in places; ...they discharge, during a considerable portion

of the year, very little, if any, water into San Francisco. It is only immediately after the rainy season, which is usually ended by February, and during the thaw of the snow ...that there is any considerable discharge of water from them in this direction" [Coulter 1835, p.60]. Fremont, in his Memoirs, also reported flow into the San Joaquin, remarking that "In times of high water, the lake discharges into the Joaquin, making a continuous water line through the whole extent of the valley." Both of these observations, and many others like them, were based on hearsay or memory, rather than actual first-hand observations.

Later technical descriptions by professionals working in the area reported flow moving predominantly from north to south, into the Tulare Lake Basin. Lieutenant Derby explored the "Tulares Valley" in 1850, which was a wet year, in search of a site for a military outpost [Farquhar 1932b] and attempted to cross between the basins at the site of Fresno Slough in April of that year. He reported that the ground between the lake and the San Joaquin was "entirely cut up by small sloughs which had overflowed in every direction, making the country a perfect swamp....We were engaged...in getting through the mire, crossing no less than eight distinct sloughs, one of which we were obliged to raft over. In all of these sloughs a strong current was running southwest, or from the San Joaquin river to the lake."

In 1853, the U.S. War Department undertook surveys for a railroad route from the Mississippi River to the Pacific Coast. Blake, the geologist on this mission, described the overflow area, noting that "when the level of the river is greatly raised by freshets it overflows its banks, and the water passes to the lakes by this slough. At seasons of low water, all communication between the river and lake is prevented by a bar at the mouth of the slough." [Williamson 1853, p.192].

Others have reported that water was exchanged between the two basins through subsurface flow. The Irrigation Congress, reporting on field work for canals in the

San Joaquin and Tulare Lake Basins, speculated that "the San Joaquin receives an important accession of volume from underground drainage — probably from the Tulare Lake drainage." [Anonym. 1873, p.8]. However, most accounts of groundwater in this area indicate that it was "stagnant" [Mendenhall et al. 1916], discharging at the surface. Additionally, groundwater contours of the Valley [e.g., Ingerson 1941; Mendenhall et al. 1916], indicate that groundwater predominantly moved downslope toward the valley trough, rather than along the axis of the valley. We were unable to locate any authoritative accounts of groundwater exchange along a north-south axis or any that allowed us to eliminate this potential exchange.

### **Tulare Lake Basin Water Balance**

We also calculated a water balance around the valley floor of the Tulare Lake Basin, using the same procedure described previously for the entire Central Valley. The results of this water balance are presented in Table 8. All of the factors and assumptions used in the analysis are listed on the table in the column headed "source/assumptions."

We used different consumptive use factors in the Tulare Lake Basin than in the north because climatic and hydrologic conditions there are distinct. This area is "desert-like and barren....during the summer and autumn..." when it is reported to be "without green vegetation...and gives unobstructed passage to steady currents of air.." [Blake 1856, p.1]. Thus, we used consumptive use factors for grassland and saltbush that were 50 percent less than we used in areas to the north.

We also used a combined tule marsh/lake evaporation rate of 6 ac-ft/ac. During wet cycles, extensive freshwater lakes were formed, which in dry cycles were partially drained and their lower levels replaced by marshes [Forbes 1941, p.17]. Thus, the ratio of lake surface area to marsh was constantly changing under natural conditions. Therefore, we used a mean tule marsh/lake evaporation rate of 6 ac-

TABLE 8

## TULARE LAKE BASIN WATER BALANCE FOR NATURAL CONDITIONS

Element in Water Balance	Long-term, Average Annual Water (millions of ac-ft/yr)	Source/Assumptions
<b>Water Supply</b>		
Rim Inflow	3.5	For period 1889-1929; DPW Bull. 29 (1931), Table 5
Precipitation on Valley Floor	4.5	Valley floor area ( $6,503 \times 10^3$ acres) times average precipitation (8.3 in.) from Schreiner (1987)
<b>TOTAL SUPPLY</b>	<b>8.0</b>	
<b>Water Use</b>		
Riparian Forest (Valley oak)	0.9	Forest area ( $515 \times 10^3$ acres) times evapotranspiration (1.7 ac-ft/ac) from Lewis (1968)
Prairie	2.0	Prairie area ( $4,027 \times 10^3$ acres) times evapotranspiration (0.5 ac-ft/ac) based on 50% of the mean (Table 7)
Saltbush	1.3	Saltbush area ( $1,298 \times 10^3$ acres) times evapotranspiration (1 ac-ft/ac) estimated as 50% of the average saltgrass use (Table 7)
Tule Marsh/Lake Evaporation	3.9	Total area ( $643 \times 10^3$ acres) times evapotranspiration (6 ac-ft/ac) from Table 6
<b>TOTAL USE</b>	<b>8.1</b>	
<b>IMBALANCE</b>	<b>-0.1</b>	

ft/ac. This is 40 percent greater than lake evaporation [Anderson and Idso 1987], which Forbes estimated to be 4.4 ft/yr [Forbes 1931, p. 541].

We found that for natural conditions, water use in the basin slightly exceeded in-basin supply by about 100,000 ac-ft/yr over the long-term. This suggests that the Tulare Lake Basin may have had an unidentified water supply, which we believe was surface and subsurface overflow from the San Joaquin Basin into the Tulare Lake Basin. Within the limits of error for this type of analysis, this suggests that the Tulare Lake Basin overflow did not contribute large quantities of water to San Francisco Bay. However, it is certainly possible that, during very wet years, a larger quantity of water could have been exchanged, depending upon the volume of water stored in the natural lakes just before the flood flows began. A conservative upper bound for this overflow is the total rim inflow for the basin or 3.5 million ac-ft/yr (Table 8). If the overflow were on the average this large, which we believe is physically impossible, it would not change any of the conclusions presented here.

## RECOMMENDATIONS

The concepts and calculations presented here should be viewed as a first step in estimating what the natural inflows to San Francisco Bay may have been.

Estimates such as these are difficult to make due to the absence of quantitative measurements, and considerable additional work is required to refine our first attempts. We recommend the following additional studies and analyses:

- 1) Water use by tule marshes and riparian forests that were indigenous to the Central Valley should be measured in field studies in preserved wetland areas.
- 2) The ecology and hydrology of freshwater marshes such as those that were common throughout the Central Valley have never been studied in a

comprehensive manner. Field studies in preserved wetlands should be conducted to determine, among other things, the source of water, the volume of water storage, species distribution and abundance, and the effect of floods and droughts on marsh productivity. The excellent research conducted in Europe and the USSR on mires, bogs, and swamps should be used as a guide [e.g., Ivanov 1981].

- 3) Daily salinity and tidal data have been collected at the Presidio, at the Golden Gate, since 1855. This information should be analyzed to confirm the concepts presented here. Historic changes in Delta outflow (Figure 1) should be reflected in tidal and salinity records at this site. Some of the tidal data have been reported elsewhere [Smith 1980], and we believe the increase in tidal height from 1860 to 1885 shown in these records reflects increased Delta outflows from the extensive harvesting of riparian forest and draining of swamps that occurred then [Meade and Emery 1971].
- 4) An extensive body of technical information exists in pre-1900 State and Federal reports, which were then published as appendices to congressional proceedings. Many of these have been abstracted and tabulated in bibliographies on the State [e.g., Cowan and Cowan 1933; Hasse 1908]. A thorough search and synthesis of this material may yield additional information that could further clarify the natural system.
- 5) Eye witness accounts can also provide valuable information. Many of the original journals and maps are archived in the Bancroft Library on the University of California's Berkeley campus. Additional diaries and journals of early explorers and settlers should be consulted to determine the response of the natural system to droughts and floods. Events of interest should be compiled and tabulated in a consistent format and classified by



year type (wet, dry) using the excellent climatological research that is available [e.g., Graumlich 1987; Lamb 1977; Lynch 1931].

- 6) Existing natural vegetation maps of California [Kuchler 1977; Roberts et al. 1977] should be revised using historic accounts as presented in journals, diaries, and early technical reports appended to congressional proceedings.
- 7) Our analyses have focused on the effect of changes in valley floor vegetation on Delta outflow. The influence of changes in upslope vegetation on freshwater inflow to the Bay should also be explored. Some important additional areas to investigate include timber harvesting in the Sierra and Coastal range forests, converting chaparral to grassland, and the accidental introduction of annual grasses into the prairie.
- 8) A reservoir operations study should be performed on the Central Valley and its ancient storage reservoirs - the natural flood basins and groundwater aquifers - to determine the monthly distribution of flows under natural conditions.
- 9) The surface area of the natural flood basins was much greater than the surface area of man-made reservoirs that replaced them. This means that under natural conditions, water surface evaporation was much greater than it is today. This was not considered in this work. It should be evaluated in future studies.

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**From:** Simonek,Laura J  
**Sent:** Thursday, May 24, 2012 10:43 AM  
**To:** 'Valerie Connor'  
**CC:** jpeltier@westlandswater.org  
**Subject:** FW: Delta Smelt Habitat Paper Submitted  
**Attachments:** Sommer Delta Smelt Habitat Paper Submitted 5 2012.pdf

Val: Good morning. Can you distribute to the tech team. Let's get a review if possible. Thanks! L

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**From:** Jason Peltier [mailto:jpeltier@westlandswater.org]  
**Sent:** Thursday, May 24, 2012 7:07 AM  
**To:** T Birmingham; Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Burman,Brenda W; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Simonek,Laura J; LLoyd Fryer; 'Martin McIntyre'; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Patterson,Roger K; Rose Schlueter; Sheila Greene; Arakawa,Stephen N; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'  
**Subject:** FW: Delta Smelt Habitat Paper Submitted

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**From:** Jerry Meral [mailto:jerry.meral@resources.ca.gov]  
**Sent:** Wednesday, May 23, 2012 7:52 PM  
**To:** King Moon, Laura; rpatterson@mwdh2o.com; jpeltier@westlandswater.org  
**Cc:** Karla Nemeth; Carl Wilcox  
**Subject:** FW: Delta Smelt Habitat Paper Submitted

I think this will help with our habitat efforts.

Jerry

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**From:** Sommer, Ted [mailto:tsommer@water.ca.gov]  
**Sent:** Monday, May 21, 2012 10:23 AM  
**To:** Jerry Meral  
**Cc:** Messer, Dean F.; Spaar, Stephani; McEwan, Dennis  
**Subject:** Delta Smelt Habitat Paper Submitted

Jerry,

Thanks for your patience on the delta smelt habitat white paper. I wanted to let you know that I submitted the attached paper today to the journal San Francisco Estuary and Watershed Science. I was able to take advantage of quiet BDCP week (i.e. no long reviews), plus I finally got the material I needed from my co-author, who left DWR this fall to go back to grad school.

Note that I had already provided copies of the last draft to the BDCP consultants, who incorporated some of the information into their analyses.

Don't hesitate to let me know if you have any questions.

Regards,

Ted Sommer, PhD  
Program Manager II

California Department of Water Resources  
3500 Industrial Blvd  
West Sacramento CA 95691-6521  
Mailing Address: PO Box 942836  
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**A Place To Call Home:**  
**A Synthesis of Delta Smelt Habitat in the Upper San Francisco Estuary**

Ted Sommer and Francine Mejia  
*California Department of Water Resources, Division of Environmental Services, P.O.*  
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*Abstract.* We used a combination of published literature and field survey data to synthesize the available information about delta smelt *Hypomesus transpacificus*, a declining native species in the San Francisco estuary. Delta smelt habitat ranges from San Pablo and Suisun bays to their freshwater tributaries, including Delta and the Sacramento and San Joaquin rivers. In recent years, substantial numbers have colonized habitat in Liberty Island, a north Delta area which flooded in 1997. The species has more upstream distribution during spawning periods and a more downstream distribution during wetter years. Delta smelt are most common in low salinity habitat (<6 psu) with high turbidities (>12 ntu) and moderate temperatures (7-25°C). They do not appear to have strong substrate preferences, but sandy shoals may be important for spawning. The evidence to date suggests that they generally require at least moderately tidal habitats. Delta smelt also occur in a wide range of channel sizes, although they seem to be rarer in small channels (<15 m wide). Nonetheless, there is some evidence that open water habitat adjacent to long residence time areas (e.g. tidal marsh, shoal, low order channels) may be favorable. Other desirable features of delta smelt habitat include high calanoid copepod densities, and low levels of submerged aquatic vegetation and the toxic algae *Microcystis*. While enough is known to plan for large scale pilot habitat projects, these efforts are vulnerable to several factors, most notably climate change, which will change salinity regimes and increase the occurrence of lethal temperatures. We recommend a “bet hedging” approach coupled with extensive monitoring and adaptive management. An overall emphasis on ecological processes rather than specific habitat features is also likely to be most effective.

## Introduction

The San Francisco Estuary is one of the prominent features of the California coastline. The estuary is both unconventional and complex, supporting diverse habitats ranging from marine bays to brackish marshes and tidal freshwater wetlands. Given the extreme level of urbanization and hydrologic alteration of the estuary, it is therefore not surprising that identifying and protecting the habitats of endemic plants and animals has become one of the major resource management issues in the San Francisco Estuary (Figure 1). Habitat increasingly has become a target of management and restoration as a result of declines in multiple trophic levels. Of the various declines, the highest-profile has been the collapse of the pelagic fish community of the upper San Francisco estuary (Sommer and others 2007). Indeed, few regional fisheries issues have generated as much debate as the habitat requirements of delta smelt *Hypomesus transpacificus*, a native osmerid that occurs only in the low salinity zone of the system. The population has declined precipitously over the past decade, leading to major legal and regulatory actions to try and improve its status (Service 2007; Sommer and others 2007). The species is currently listed as Threatened under the Federal Endangered Species Act and Endangered under the California Endangered Species Act (USFWS 2008).

This annual species is confined to a single estuary, so maintenance of the population depends in part on habitat conditions in the Sacramento-San Joaquin Delta (herein referred to as the *Delta*), the upstream region of the San Francisco Estuary from which the species gets its name (Figure 1). The hydrodynamics of the Delta's highly interconnected channels are especially complex and highly altered, with major changes to

key parts of the distribution of delta smelt. One of the biggest hydrologic changes over the past century has been the construction of the large Central Valley Project (CVP) and State Water Project (SWP) water diversions, which supply water to about 25 million California residents and a multi-billion dollar agricultural industry (Grimaldo and others 2009).

Given its legal status, there has been substantial progress in understanding the life history of this species (Moyle and others 1992; Bennett 2005; Nobriga and Herbold 2009). The typical pattern is for delta smelt to inhabit the oligohaline to freshwater portion of the estuary for much of the year until late winter and early spring, when they migrate upstream to spawn (Sommer and others 2011a). Following hatching, their young subsequently migrate downstream in spring towards the brackish portion of the estuary (Dege and Brown 2004). Some of the key physiological and environmental requirements are understood based on laboratory studies and analyses of field data (Swanson and others 1998, 2000; Baskerville-Bridges and others 2004; Feyrer and others 2007; Nobriga and others 2008).

The primary objective of this paper was to synthesize the available information about the habitat of delta smelt and to provide insight into what may happen in the future. Although there are multiple definitions of habitat, we have chosen to consider delta smelt habitat as the physical, chemical, and biological factors in the aquatic environment of this species (Hayes and others 1996). Moreover, we assume that the maintenance of appropriate habitat quality is essential to the long-term health of delta smelt (Rose 2000; Peterson 2003). We emphasize that this does not mean that this report assumes that habitat is the primary driver of the delta smelt population. To the contrary, there is

91 substantial evidence that delta smelt are controlled by a complex set of multiple  
92 interacting factors (Sommer and others 2007; Baxter and others 2010; MacNally and  
93 others 2010). Therefore, it should not be assumed that providing good habitat conditions  
94 now or in the future will guarantee delta smelt success. In ecological terms, this issue is  
95 often considered in terms of the *realized* versus *fundamental* niche of a species. Having  
96 lots of suitable habitat creates the potential for delta smelt to occupy a large area (i.e.  
97 *fundamental niche*), but the *realized* distribution may be much smaller because other  
98 factors (e.g. predators) limit their ability to use all of the available area. In other words,  
99 habitat is a necessary but not sufficient condition to support delta smelt. Habitat is,  
100 nonetheless, unique in that it not only directly affects the species of interest (delta smelt),  
101 but all affects other population drivers including “top-down” and “bottom-up” effects.  
102 As such, it provides an excellent useful starting point for evaluating the ecological status  
103 of species and potential restoration options.

104 A key point in evaluating delta smelt habitat is that it needs to be considered in two  
105 different ways. First, it can be considered in a geographical context based on fixed  
106 regions of the delta that seem to be important for delta smelt such as the west Delta,  
107 Suisun Bay, and Cache Slough Complex. Because the estuary is strongly tidal and delta  
108 smelt are a pelagic fish strongly associated with distinct salinity ranges (Dege and Brown  
109 2004; Feyrer and others 2007; Kimmerer and others 2009), its habitat must also be  
110 considered as constantly shifting in position along the axis of the estuary. In physical  
111 science terms, the former is the Eulerian frame of reference, while the later is the  
112 Lagrangian frame of reference.

For the purposes of this study, we focused on the following major questions: 1) what are the basic physical, chemical, and biological requirements for delta smelt habitat? 2) What geographic areas currently provide these conditions? 3) What habitat types support delta smelt? 4) Given factors such as climate change, will the upper estuary provide suitable conditions in the future? With respect to the last question, a second major objective of the study was to identify which areas and habitat features will improve the survival chances of delta smelt. Hence, our analysis was clearly targeted at providing direction for large scale restoration efforts being considered under programs such as the Bay Delta Conservation Plan (BDCP) and recent Biological Opinions (FWS 2008).

Because of the limited nature of the data available on delta smelt, our study was not intended as a “bible” for their habitat. Specifically, our synthesis does not provide detailed description of what delta smelt require for any single factor, habitat, or geographic area. Moreover, we focus on the direct habitat needs of delta smelt, but do not substantially address the role of subsidies across habitats that this fish do not necessarily occupy (e.g. tule marsh contributions to the smelt food web). Our goal was therefore to provide a basis for generating testable hypotheses for future restoration and research projects. Given the rarity of delta smelt and associated constraints on field collection, we also hoped that our analyses of existing data would help to set priorities for future studies.

## **Methods and Materials**

Assessing habitat needs of delta smelt is especially challenging because the fish is very small (usually <100 mm FL), fragile, increasingly rare, and has a protected legal status (Moyle 2002; Bennett 2005). A related issue is that the San Francisco estuary is vast and spatially complex, with multiple tributaries, embayments, and braided channels (Figure 1). High turbidity levels in the estuary present major challenges to direct observations of habitat use. As noted previously, the need to evaluate smelt habitat in both Lagrangian (moving flow field) and Eulerian (fixed locations) frames of references complicates the interpretation of the available data. Finally, observational data on different habitats can yield ambiguous or even misleading results. For example, juvenile Chinook salmon densities are consistently higher along the narrow rip-rapped edge of the Sacramento River than in the broad expanses of the adjacent Yolo Bypass floodplain (Ted Sommer, California Department of Water Resources, unpublished data). In other words, care must be used to correct observational data for habitat availability.

Several of these issues meant that currently it is not feasible to use traditional habitat assessment techniques such as telemetry, mark-recapture, or visual observation. We therefore relied on a combination of published literature, data analyses from long- and short-term fisheries surveys, and the expert opinion of colleagues to synthesize the available information with delta smelt. There is no question that our approach has a higher uncertainty than direct observational methods; however, the information represents the best available given the many constraints. Although our synthesis does not follow the format of a traditional scientific paper, similar efforts to integrate multiple information sources have proven useful to guide subsequent research and restoration (e.g. Moyle and others 2004).

## *Data Sources*

*Literature:* We focused on peer-reviewed literature, the majority of which was from the San Francisco estuary and about delta smelt. For topics with no journal publications, we also included some agency reports and unpublished manuscripts.

*Long-term surveys:* The following describes several of the key Interagency Ecological Program monitoring surveys that collect delta smelt. Several of the descriptions are from Sommer and others (2011a) and are presented approximately in ontogenetic order starting with larvae.

Initiated in 1995, the California Department of Fish and Game (DFG) 20 mm survey typically samples larvae during each neap tide between March and July (Dege and Brown 2004). A total of 48 sites have been sampled continuously and include freshwater to mesohaline habitats of the estuary. Three 10-min oblique tows are conducted at each location using a 5.1-m long, skid mounted net with a 1.5 m<sup>2</sup> mouth, a 1.6 mm mesh body and a removable 2.2 L cod end jar. Zooplankton tows were collected simultaneously using a Clarke-Bumpus net (0.160 mm mesh nylon cloth, outer mouth diameter of 12.5 cm, 76 cm length with a cod-end screened with 0.140 mm mesh) Volume was recorded with a General Oceanics model 2030 flow meter. Zooplankton samples were preserved in 10% formalin with Rose Bengal dye. Preserved samples were concentrated in the laboratory by pouring them through a sieve screened with 0.154 mm mesh wire, rinsed, then reconstituted to organism densities of 200-400 per milliliter. A 1 milliliter subsample was then extracted and counted and identified in a Sedgewick-Rafter cell. For



the purposes of this study we focused on counts of calanoid copepods, a key food source for delta smelt (Nobriga 2002; Bennett 2005).

The Summer Townet Survey (TNS) has been conducted annually by DFG 1959. The survey was designed to index the abundance of age-0 striped bass, but also collects delta smelt data that have been used to analyze abundance, distribution, and habitat use (Kimmerer 2002; Bennett 2005; Nobriga and others 2008). The TNS samples up to 32 stations using a conical net (1.5 m<sup>2</sup> mouth; 2.5 mm cod-end mesh) towed obliquely through the water column.

The DFG fall midwater trawl (FMWT) samples fishes in open-water and other offshore habitats monthly each September to December at 116 stations throughout the northern region of the estuary. The survey at each location takes a 10 to 12-minute tow with a 13.4 m<sup>2</sup> midwater trawl of variable meshes starting with 20.3 cm mesh at the mouth of the net and 1.3 cm mesh at the cod end (Feyrer et al. 2007). The survey represents one of the best long-term fishery data sets for the San Francisco estuary and covers the majority of the range of delta smelt. The FMWT samples delta smelt distribution and relative abundance during the period leading up to, but not including their spawning migration. Thus, it provides a long-term dataset on where delta smelt are distributed in the estuary. The survey has been conducted since 1967 with the exception of 1974 and 1979.

The DFG Spring Kodiak Trawl survey (SKT) has been conducted since 2002 as a survey to assess the distribution of adult delta smelt during the time they ripen and spawn (Source: <http://www.delta.dfg.ca.gov/data/skt/>). It samples 39 locations from Napa River upstream through Suisun Bay and the Delta (Figure 1). The survey has been conducted

every 2-4 weeks in winter and spring starting in January or February. At each location, a single 10 minute surface sample is taken by two boats that tow a 7.6 m wide by 1.8 m high Kodiak trawl (mesh ranges in dimension from 5.1 cm knotted stretched mesh at the mouth and decreases by 1.3 cm through a series of 5 panels to 0.6 cm knotless stretched mesh at the cod-end).

The USFWS Beach Seine Survey uses a 12-meter long by 1.2 meter high seine to collect inshore fishes from areas generally less than one meter deep (Brandes and McLain 2001). Seine hauls are conducted year-round at 57 current sampling stations from San Francisco Bay upstream to the lower Sacramento and San Joaquin Rivers. Unlike most other surveys, basic substrate data is collected for this program. In addition to the core USFWS, we examined data from special surveys in Liberty Island, a flooded tidal wetland in the Cache Slough Complex. The surveys during August 2002-October 2004 used similar methods as the regular USFWS Beach Seine program at ten core sites located around the periphery of the lower portion of the island (Figure 2).

*Short-term and geographically-limited studies:* One of the key studies used to identify habitat use by delta smelt was the DFG Delta Resident Fishes Survey (Brown and Michniuk 2007). This survey used an electrofishing boat to sample 200-m reaches of shoreline spread across several delta regions. The timing of this survey has been sporadic, with sampling that collected delta smelt in 1981-1982, 1995-1997, and 2001-2003.

Another source of data about delta smelt use of small channels was the California Department of Water Resources Yolo Bypass study, which includes larval sampling and rotary screw trapping. This sampling occurred near the base of Yolo Bypass in a 40 m

wide perennial channel. Methods for the two surveys are summarized in Sommer and others (2004a) and Feyrer and others (2006).

*Data Analyses:* Delta smelt are a relatively rare and patchy fish, so most survey data were summarized based on presence-absence data. To summarize the general locations of delta smelt habitat by life stage, we summarized the upstream and downstream distribution limits for each of the major surveys: FMWT, SKT, 20 mm, and TNS. The center of distribution was calculated for each survey (Sommer and others 2011b). Data were summarized separated for wet and dry years using all years since 1995, when all four surveys were conducted.

For several analyses, we calculated the percentage of samples with delta smelt present for under different conditions (e.g. substrate, geographic locations). Where possible, we did statistical analyses. For example, we used this approach for USFWS beach seine data to compare delta smelt habitat use in Liberty Island as compared to concurrently collected data from the core west and north Delta station region where the population is often centered (Sommer and others 2011a; Figure 3). We focused on six west and north Delta stations (Sandy Beach SR012W; Stump Beach SR012E; Rio Vista SR014W; Brannan Island TM001N; Eddo's SJ005N; Sherman Island MS001N; Antioch Dunes SJ001S) that commonly catch delta smelt. Differences in percent of samples with delta smelt were compared for the Liberty Island (Figure 2) and the core Delta sites during the same sampling period (2002-2004) using a Kruskal-Wallis test. The USFWS beach seine data for the core Delta stations were also used to evaluate substrate use. Only data after 1993 were used because they included substrate information (mud, pavement, vegetated, sand, gravel). We did a Chi-square test comparing the number of samples in which delta

smelt were captured on each substrate type to the total samples (i.e. effort) on each substrate type. However, we acknowledge that fixed stations are not an optimal approach to habitat use. One concern about the use of fixed stations is that salinity-induced shifts in the distribution of delta smelt along the axis for the estuary, which may “push” delta smelt away from or towards certain substrate types.

Food was analyzed for the 20 mm survey, the only IEP sampling program which collects data simultaneous with fish at each station. As others have shown, generalized additive models (GAMs) can be used to examine the associations between fish occurrence and habitat variables such as salinity, temperature, and turbidity (Stoner and others 2001; Feyrer and others 2007; Kimmerer and others 2009). We examined whether adding food availability improved the model predictions for delta smelt. The technique uses smoothers to describe the empirical relationships between predictor and response variables and therefore does not assume particular relationships between the two. We used the GAM function in the MGCV package of the statistical program R (R Development Core Team 2011; Wood 2011) with a logit link function to determine whether there were significant relationships between four response variables (mean temperature; mean EC; mean secchi depth; mean calanoid copepod density) and the presence of delta smelt in 20 mm samples for 1995-2009. The variables were tested both individually and in combination with each other. We analyzed the GAM results in two ways. First, we examined whether the smoothed results were congruent with expected responses based on laboratory tests and ecological literature. Specifically, we expected that delta smelt would show a unimodal response to temperature and salinity, a declining occurrence relatively to Secchi (Feyrer and others 2007), and an increasing or saturating

response to food availability (e.g. Holling 1959). Second, we assessed statistical significance of the GAM outputs using an approximation of the ability of each variable to reduce null deviance in the models (Venables and Ripley 1997; Feyrer and others 2007).

## **Delta Smelt Habitat: A Synthesis**

### **Basic Habitat Requirements**

**Salinity:** Salinity is the main factor that defines an estuary, so understanding salinity requirements is an essential in describing the habitat of estuarine organisms. Because of the ease of measurement, salinity is often represented based on electrical conductivity. The two units are not strictly interchangeable because of variation in the ionic composition of different regions of the San Francisco estuary (e.g. oceanic salts vs. agricultural salts in the San Joaquin River).

More so than any other delta smelt habitat variable, salinity has been the subject of intense research and debate. Higher flow levels shift the salt field downstream, as commonly represented by X2, the distance of the 2 psu salinity isohaline from the Golden Gate Bridge (Jassby and others 1995; Kimmerer 2002). There are no long-term trends in the salinity of the upper estuary for most months (Jassby and others 1995; Enright and Culberson 2010); however, there have been salinity increases during fall (Feyrer and others 2007), when the issue has become most controversial.

Delta smelt are strongly associated with the low salinity zone, typically <6 psu or <10,000 uS/cm (Feyrer and others 2007; 2010; Kimmerer and others 2009). Our GAM

results for the 20 mm survey showed a similar pattern (Figure 4; Table 1). The distribution of delta smelt is therefore affected by salinity at multiple life stages. For example, Dege and Brown (2004) found that the center of distribution of young delta smelt during spring was determined by the location of the salt field, with a more downstream distribution during wetter years. Similarly, Sommer and others (2011a) found that the center of distribution of older delta smelt was consistently associated with the location of the salt field (X2) during all months. As will be discussed below, this does not mean that all smelt are confined to a narrow salinity range since fish occur from fresh water to relatively high salinities.

The effects of salinity on habitat area vary seasonally and therefore by life stage. Kimmerer and others (2009) found that X2 had a negative association with habitat area (i.e. higher flow = more area) for all surveys analyzed, but the effect was strongest in spring and summer. They suggest that earlier life stages were more responsive to salinity changes because they tend to occupy fresher water than older delta smelt. Despite a clear effect of estuarine salinity on habitat area, Kimmerer and others (2009) did not observe strong effects on abundance. Feyrer and others (2010) also found a negative effect of X2 on habitat area during the fall. Feyrer and others (2007) report a long-term decrease in habitat area based on the combined effects of salinity and turbidity (as indexed by Secchi depth), and a weak effect of fall conditions on juvenile production the following summer. The significance of these results has been the source of intense debate as part of legal challenges to the USFWS (2008) Biological Opinion for delta smelt, which included new requirements to change X2 during the fall of wet years.

318           **Tides and Flow:** There have been occasional collections of delta smelt upstream  
319 of the tidal zone north of Sacramento (USFWS Juvenile Salmon Survey, unpublished  
320 data). All of these occurred during the winter and spring spawning season. Despite these  
321 rare exceptions, the habitat of delta smelt is focused entirely in the tidal zone. It is not  
322 known if delta smelt can survive in areas without consistent tidal flows as may be the  
323 case for some areas in the future with sea level rise (see below).

324       Delta smelt currently are found in the small channels such as the Yolo Bypass Toe  
325 Drain, where tidal flows are periodically less than  $\pm 4 \text{ m}^3/\text{sec}$  during months when smelt  
326 are present (Lisbon Gauge, Department of Water Resources, unpublished data), to areas  
327 with stronger tides such as Chipps Island, where representative summer tidal flows are  
328  $\pm 9400 \text{ m}^3/\text{sec}$  (DWR 1993). It is highly likely that delta smelt use some form of tidal  
329 surfing to change their location in the estuary (Swanson and others 1998; Sommer et al.  
330 2011a). Bennett and others (2002) provide evidence that young longfin smelt (*Spirinchus*  
331 *thaleichthys*) use tidal surfing to maintain their position in the estuary, so it is reasonable  
332 to assume that a close relative like delta smelt does the same. Sommer and others (2011a)  
333 used a particle tracking model to show that apparent upstream migration rates of adult  
334 smelt were consistent with simulations based on a simple tidal surfing behavior.

335       **Velocity:** Closely related to tides and flow is water velocity. This variable may be  
336 much less relevant to fishes in the highly tidal upper San Francisco estuary than for  
337 species that live in riverine systems. Even in a tidal environment, it is likely that delta  
338 smelt respond to covariates of velocity such as turbulence, so velocity should not be  
339 ignored as a habitat feature.

The effects of water velocity on delta smelt are understood primarily from laboratory studies. Swanson and others (1998) showed that maturing delta smelt probably can swim for long periods at rates of 1-2 body lengths per second, representing about 6-12 cm per second. Critical swimming velocities were around 28 cm/second. These rates were comparable or somewhat lower than similar-sized fishes for the same temperature range.

**Turbidity:** Important progress in our understanding of the habitat needs of delta smelt is that the species requires turbid water. Traditionally, fisheries biologists have viewed high turbidities as a detriment to fish based on extensive evidence that high sediment loads degrade the quality of salmon habitat (Newcombe and Macdonald 2011). This has led to widespread regulations for logging and construction projects along the Pacific Coast to limit sediment loading to rivers. However, Feyrer and others (2007) found that delta smelt are strongly associated with turbid water. Their results showed that during fall delta smelt are only present at locations where Secchi depth is less than 1 meter deep. This finding is consistent with Grimaldo and others (2009a), who found that the occurrence of delta smelt at the SWP salvage facilities was linked, in part, with high turbidities. Specifically, delta smelt were not present when turbidities were less than about 12 ntu. This results are consistent with our GAM analyses of the 20 mm data set, which showed that young delta smelt are strongly associated with lower Secchi depths (Figure 4: Table 1).

The specific mechanism by which delta smelt require high turbidity is not known. An obvious potential function of turbidity is that it may help delta smelt avoid visual predators (Baskerville-Bridges and others 2004; Feyrer and others 2007; Nobriga and Herbold 2009). Light apparently plays a role in feeding ecology as laboratory studies



show that consumption is low in clear water ((Mager 1996; Baskerville-Bridges and others 2004). It is possible that turbidity helps create a contrasting background for delta smelt to locate their prey.

One of the most disturbing long-term changes in for delta smelt has been the increase in water clarity in the upper estuary (Jassby and others 2002; Wright and Schoellhamer 2004; Feyrer and others 2007). Moreover, modeling by Schoellhamer (2011) suggests that there has been a sudden recent (1999) increase in water clarity as the sediment balance shifted. In contrast to other habitat variables such as salinity, these trends are not driven by hydrology (Jassby and others 2002). As noted in Baxter et al. (2010), the primary mechanisms suggested to explain the increasing water clarity are: 1) reduced sediment supply due to dams in the watershed (Wright and Schoellhamer 2004); 2) major flood events (e.g 1982-1983) that washed out large amounts of sediment (Baxter and others 2010); and 3) biological filtering by submerged aquatic vegetation (Brown and Michniuk 2007, Hestir and others In review). Whatever the mechanisms, this change appears to have had a serious effect on habitat quality for delta smelt during both summer (Nobriga and others 2008) and fall (Feyrer and others 2007).

**Temperature:** Upper temperature limits for delta smelt habitat have been relatively well-studied in both the laboratory and using field data. Interpretation of the laboratory results is somewhat complicated as temperature limits can be affected by various factors including acclimation temperature, salinity and feeding status. The general pattern is that delta smelt cannot tolerate temperatures higher than 25°C (Swanson and others 2000), a level that is highly consistent with field collections of young smelt (Nobriga and others 2008) and our GAM results for the 20 mm data set (Figure 4; Table 1). Hence, the 25°C

is currently used at the general guideline to assess the upper limits for delta smelt habitat (Wagner and others 2011; Cloern and others 2011).

The lower limit to water temperature has not yet been evaluated in detail. However, Bennett and Burau (2010) analyzed the occurrence of adult in the Spring Kodiak Trawl based on three water quality variables. Their preliminary results suggest that delta smelt are rare below about 7°C. Note, however, that temperatures below 10°C are uncommon in the estuary (Kimmerer 2004; Nobriga and Herbold 2009).

**Depth:** Like velocity, the relevance of depth to a pelagic fish in a tidal estuary is open for debate. Landscape variables such as depth are, nonetheless, clearly important features that define tidal dynamics such as velocities, excursion, and frequency of inundation. Unfortunately, depth is not recorded for many of the pelagic trawls in the upper estuary making it difficult to evaluate this variable. Some data are available for littoral surveys, but delta smelt catch is generally too low for a rigorous statistical analysis. While generally regarded as a pelagic fish (Moyle 2002), delta smelt are clearly caught in shoal and shallow inshore areas such as Suisun Bay and Liberty Island (Moyle and others 1992; Nobriga and others 2005; Sommer and others 2011a). Aasen (1999) found that juvenile smelt densities can actually be higher in shoal areas than adjacent channels. However, delta smelt use of shallow areas apparently varies with tide (Aasen (1999) and they probably do not substantially use the shallowest tidally dewatered edge areas (Matt Nobriga, USFWS, unpublished data). There does not appear to be an obvious maximum depth for delta smelt as the fish are commonly captured along the Sacramento Deep Water Ship Channel (Grimaldo and others, In prep; DFG Spring Kodiak Trawl:

<http://www.dfg.ca.gov/delta/data/skt/DisplayMaps.asp>), which has most of the deepest habitat in the upper estuary.

**Channel size:** Most data has been collected in large channels, making it difficult to evaluate what types delta smelt prefer. It is likely that channel width itself is not a constraint; instead, delta smelt are likely to be cued into related habitat features such as tidal excursion, velocity, temperature, and turbidity. There does not appear to be a clear upper limit for channel width as the FMWT and TNS data show that delta smelt are common in large channels including broad bays that are several km wide. For example, some of the most numerically important areas for delta smelt catch are Cache Slough, a 200-280 m wide channel (20mm station 716, TNS & FMWT stations 716 and 721) and the Sacramento Deep Water Ship Channel, with a 170-200 m wide channel (TNS and FMWT stations 719 and 797).

The lower limit to channel size for delta smelt has still not been addressed. In the Delta, the smallest channels that we are aware of where delta smelt have been collected are around 45 m wide. One example is a small perennial channel of the Yolo Bypass—both adult and larval stages seasonally were collected there in many years (Sommer and others 2004). Another narrow channel with regular catches of delta smelt larvae is Miner Slough at 45-50 m wide (20 mm station 726). Downstream of the Delta, the smallest channel where adults and juveniles have been reported is Spring Branch Slough in Suisun Marsh, which averages about 15 meters near the sampling area of the UC Davis Suisun Marsh Survey (Meng and others 1994; Matern and others 2002). These fish are most commonly caught during winter, usually January to March (Teejay Orear, UC Davis, unpublished data).

**Food:** Even if physical and chemical requirements are met, delta smelt will not survive if habitat does not contain enough food to support basic metabolic needs. The food source of delta smelt is fairly specialized, relying primarily on calanoid copepods such as *Eurytemora affinis* and *Pseudodiaptomus forbsi* (Nobriga 2002; Moyle 2002). There has been a long-term decline in zooplankton in the upper estuary (Winder and Jassby 2010), which partially may account for the reduction in the mean size of delta smelt in fall (Sweetnam 1999; Bennett 2005). Overall, food limitation remains a major stressor on delta smelt (Baxter and others 2010). The importance of this variable is supported by Kimmerer (2008), who showed that delta smelt survival from summer to fall is related to biomass of copepods in the core range of delta smelt. These relationships have led to the recognition that food availability should be included in life cycle models of delta smelt (Maunder and Deriso 2011).

There is evidence of substantial spatial and temporal variation in copepods in the estuary. The most extensive database for zooplankton of the upper estuary is the IEP's Environmental Monitoring Program (<http://www.water.ca.gov/iep/activities/emp.cfm>), which includes stations in Suisun Bay, Suisun Marsh, and the West and South Delta. *P. forbesi* and *E. affinis* both frequently show their highest densities in the south Delta and Suisun Marsh (Hennessy 2009; Anke Mueller-Solger, unpublished data). *P. forbesi* is most abundant during summer to fall, while *E. affinis* largely disappears from the EMP sites in summer and fall.

From a restoration perspective, one of the more important recent findings has been that food resources are often more abundant around the periphery of the upper estuary. In the brackish zone, the smaller channels of Suisun Marsh frequently show relatively high

levels of chlorophyll *a* and copepods (Schroeter 2008; Anke Mueller-Solger, Delta Science Program, unpublished data). Similarly, studies by Benigno and others (In review) show that the channels of the Cache Slough Complex consistently have higher chlorophyll *a* levels than Delta EMP stations. The data suggest that calanoid copepod levels may be enhanced during key months for delta smelt. Longer residence times are likely a major contributing factor to increased food web production in these regions (Lucas and others 2009).

Food thresholds for delta smelt have not yet been established, although our GAM analyses provide some insights for spring. The GAM results of the 20 mm data set suggested that temperature, salinity, Secchi depth, and calanoid copepod density were all significantly associated with occurrence of young delta smelt (Table 1; Figure 4). However, the smoothed GAM results for calanoid copepods (Figure 4) did not follow the expected increasing or saturating responses (e.g. Holling 1959). Instead, the smoothed response suggested a questionable decline in delta smelt abundance at high calanoid copepod densities. An additional issue is that models that incrementally added each of the environmental variables indicated that adding calanoid copepods to the model explained only a small additional amount of deviance (2%) as compared to models with just the three physical variables (Table 1). These results suggest that calanoid copepod density was not a meaningful predictor of young delta smelt in the 20 mm survey. This does not mean that food is unimportant to young delta smelt; rather, the data may not be at a sufficient scale to detect associations.

**Substrate:** Most fish surveys in the upper Estuary do not record substrate, making it difficult to evaluate the importance of this variable to delta smelt. The relevance of

substrate in the deep channel habitat of delta smelt is questionable; for example, young smelt are typically in the middle or upper portion of the water column, particularly during day time (Rockriver 1994; Grimaldo and others, In review). Nonetheless, substrate may be relevant when delta smelt venture into littoral areas. Delta smelt catches are typically quite low in inshore areas, making it hard to analyze the data in any rigorous way.

The best available data about substrate use are from the USFWS beach seine survey (Table 2). The results suggest at least modest differences between observed and expected habitat use (Chi square = 29.15; DF = 3;  $p < 0.001$ ). Delta smelt were never collected in vegetation, despite 167 samples in such habitats. Habitat use was also much lower than expected at paved locations (boat ramps), but somewhat higher than expected over gravel, mud, and sand.

Another example is the DFG Resident Fishes Survey, which used electrofishing to sample nearshore areas during the early 1980s, mid-1990s, and early 2000s (Brown and Michniuk 2007). The survey did not have high enough catch of delta smelt to warrant statistical analysis. The 1981-1982 data collected delta smelt in 5% of 360 samples over the following substrates: rip-rap 41% of fish; mud bank 59% of fish. These proportions were very similar to the distribution of sampling effort among all sites. Sampling effort was much greater in later years (5,645 samples); however, delta smelt were collected in only 0.4% of samples. These fish were collected over rip-rap (38%), mud bank (47.6%), and sand beach (14.3%), which was somewhat different than the overall sampling effort for all sites (rip-rap 60%; mud bank 33%; sand beach 3%; mud flat 4%).

In general, these data suggest that delta smelt do not have particularly strong substrate preferences, which is not surprising given their niche as a pelagic fish. Nonetheless,

substrate may be an important issue during spawning. The substrate preferences of delta smelt are not known; however, many other smelts are known to favor sandy substrate for spawning (Bennett 2005). This substrate is relatively common in inshore areas of the west Delta (e.g. Sherman Island) and north Delta (e.g. Liberty Island and Sacramento Deep Water Ship Channel).

**Other Water Quality Factors:** The current state of knowledge about the effects of water quality problems including contaminants on delta smelt and other pelagic fishes has recently been summarized by Brooks and others (2011). The evidence to date indicates that although acute contaminant toxicity is not a likely cause for the population declines, sublethal stress from multiple factors including metals, nutrient-rich effluents, toxic algal blooms, and pesticides all degrade the habitat of delta smelt. For example, sublethal contaminant exposure can impair immune function and swimming ability of delta smelt (Connon and others 2011). Delta smelt distribution is known to overlap with several key contaminants (e.g. Kuivila and Moon 2004; Brooks and others 2011) and effects can be substantial depending on the level of exposure (Connon and others 2009).

The highest profile water quality issue has been inputs of ammonium to the Delta, primarily from municipal discharges. The largest source of ammonium to the system is the Sacramento Regional Wastewater Treatment Plant (Jassby 2008). There is no evidence yet of direct effects on delta smelt, but there are concerns about food web effects based on the finding that phytoplankton growth may at times be inhibited by high ammonium concentrations in the Delta and Suisun Bay (Wilkerson et al. 2006, Dugdale and others 2007; Glibert 2010; Glibert and others 2011). This could directly reduce

primary productivity and alter phytoplankton species composition, which may in turn affect the zooplankton community that delta smelt rely upon (Glibert and others 2011).

Another emerging and related concern for delta smelt is that there are periodic blooms of the toxic blue-green alga *Microcystis aeruginosa* during late summer, most commonly August and September (Lehman and others 2005). These blooms typically occur in the San Joaquin River away from the core summer distribution of delta smelt (Figure 3), but some overlap is apparent. Results by Lehman and others (2010a) indicate a strong likelihood that delta smelt are exposed to microcystins, which may in turn affect their habitat use (Baxter and others 2010). Laboratory studies demonstrate that the blue-green alga is toxic to another native fish of the region, Sacramento splittail *Pogonichthys macrolepidotus* (Acuna and others 2012). Indirect effects are also a major concern as *Microcystis* blooms are toxic to the primary food resources of delta smelt (Ger and others 2009; 2010a; 2010b).

Pesticide effects are less well understood, although effects may be substantial given that agricultural, commercial, and urban purchases of pesticides within the Delta and the upstream watershed averaged 21 million kg annually from 1990 to 2007 (Brooks and others 2011). Intermittent toxicity has been reported for *Ceriodaphnia dubia* an invertebrate surrogate for Delta prey species (Werner and others 2000) and *Hyaella azteca*, a common invertebrate bioassay species (Weston and Lydy 2010; Werner and others 2010).

#### **Geographical Range of Habitat**



A common misconception is that the habitat of delta smelt only occurs in the Delta. The monitoring data indicate that center of distribution for the population commonly occurs in the Delta during spring (Dege and Brown 2004) and fall (Sommer and others 2011a). However, the overall distribution of delta smelt habitat is much broader. To illustrate this point, we summarized survey data for different seasons and water year types by life stage (Figure 3). The survey data show that delta smelt habitat is often located well downstream of the Delta, commonly in Suisun Bay. Their habitat also varies substantially by life stage and water year. The habitat tends to be most landward (upstream) for adults (SKT survey) and most seaward for the other life stages (20 mm, TNS, FMWT). As expected based on their strong association with salinity (Dege and Brown 2004; Sommer and others 2011a), the habitat for younger life stages shifts landward in drier years (Figure 3).

Following the listing of delta smelt in the early 1990s, one of the most surprising initial discoveries was the presence of delta smelt in the Napa River, a tributary to San Pablo Bay (Figure 1). While they are generally caught in wet years (Figure 3), the fact that delta smelt can periodically use this downstream habitat is significant. Hobbs et al. (2007) found that use of habitat in this region results in a unique chemical signature in the otoliths of delta smelt and revealed that the portion of fish that use Napa River can be substantial (e.g. 16–18% of population in 1999).

Another key finding was that delta smelt heavily use the Cache Slough Complex (Sommer and others 2011a). As reported in Sommer and others (2011a), at least some delta smelt occur year-round in the region. Although it is unclear what percentage of the population occurs in this region, survey data suggests that this area sometimes seasonally

supports the majority of the delta smelt catch. To illustrate the importance of the Cache Slough Complex, FWS beach seine surveys during 2002-2004 show that delta smelt apparently occur year-round in Liberty Island (Figure 5) and were present in all stations sampled (Figure 2). Similarly, expanded efforts of the 20-mm, TNS and FMWT surveys into the Sacramento Deepwater Ship Channel found delta smelt June through October, the warmest months of the year (Baxter and others 2010). Delta smelt use of the Cache Slough complex appears to be substantial as the frequency of occurrence in Liberty Island habitats was comparable to FWS beach seine stations located in their core Delta habitat during 2002-2004 (Figure 6). These findings were relatively unexpected as the general assumption at the time was that delta smelt leave the north Delta after larval stage (Sommer and others 2011a). Moreover, flooded islands were generally considered poor-quality habitat for delta smelt in other parts of the Delta (e.g. Grimaldo and others 2004; Nobriga and others 2005).

Although the Napa River and Cache Slough Complex studies provide some cause for optimism with regard to the status and extent of delta smelt habitat, it is important to note one of the most troubling changes over the past four decades, the loss of the south Delta as year-round habitat for delta smelt. As noted by several studies (Nobriga and other 2008; Sommer and others 2011a), the historical data show that many delta smelt remained in the south Delta throughout the summer. While delta smelt still seasonally occur in the south Delta during winter and spring (Figure 3; Sommer and others 2011a), they are now absent in summer. Nobriga and others (2008) suggest that this is due to major habitat changes including the proliferation of aquatic weeds and associated declines in turbidity.

## **Habitat Types**

The general habitat use by delta smelt is basically a function of the features described in the previous sections. Table 3 provides a synthesis of some of the major types based on some fairly broad habitat classifications. The summary is not intended to reflect the temporal and spatial variability in delta smelt distributions within a given habitat; rather it is designed to demonstrate relative patterns among habitat types. Note also that historical collections of delta smelt in any one of these types does not guarantee that future habitat projects will support this species. Any one of a number of physical (e.g. turbidity; temperature), chemical (e.g. contaminants), and biological factors (e.g. food, competitors, predators) may limit the ability of delta smelt to colonize new areas.

## **The Future of Delta Smelt Habitat**

There is widespread consensus among scientists that the upper San Francisco estuary will be quite different in the future (Knowles 2010; Cloern and others 2011). Studies by Mount and Twiss (2005) predict that there is a high probability of massive levee failure in the foreseeable future. This will radically change the salinity distribution along with the types and locations of different habitats (Lund and others 2007; Moyle 2008). As a consequence, it is especially challenging to use observations on current delta smelt habitat to predict future changes. There have at least been efforts to model habitat based on future flow conditions through the present landscape. The results are fairly discouraging, with predictions of reduced area of low salinity habitat as soon as 50 years in the future (Feyrer and others 2011). Even more disturbing is the finding that within

100 years the number of lethal temperature days for delta smelt will greatly increase and that turbidities will decrease (Wagner and others 2011; Cloern and others 2011). At the same time major biological community changes are inevitable, along with very different physical and chemical regimes (Lund and others 2007; Cloern and others 2011). These issues raise the question of whether delta smelt will be able to persist with climate change. At the very least, the analyses help show that current habitat conditions are not sustainable (Lund and others 2007), making it critical to begin planning for ways to react to long term changes.

### **Management Implications**

The available information suggests a high degree of uncertainty about many aspects of delta smelt habitat (e.g. Brown 2003). This is to be expected given the relatively rare status of this species and the difficulty in directly measuring habitat use in a highly variable and turbid environment. This does not mean, however, that there is insufficient information to examine some of the management issues with delta smelt habitat. Some basic ideas are provided below. Note that we do not specifically address the issue of how much habitat would be required to generate a measurable increase in the population of delta smelt. Such analyses are notoriously difficult and uncertain, even for better-studied fishes such as salmonids (Roni and others 2010). A major part of the problem is that habitat often is not the only factor controlling fish abundance, likely the case for delta smelt (Sommer and others 2007; MacNally and others 2008; Baxter and others 2010).

639

640 *We know enough to attempt some large scale habitat projects.*

641

642       While there is not sufficient information to fully design delta smelt habitat,  
643 enough is known to attempt major projects to evaluate some of the key questions. For  
644 example, the salinity, turbidity, temperature, and food requirements provide a basic  
645 description of some of the most important habitat features. Moreover, the large  
646 unintentional flooding of Liberty Island and subsequent colonization by delta smelt  
647 suggests that there is some potential to expand and improve the habitat of this imperiled  
648 species. Indeed, the status of delta smelt is so dire, that we cannot simply hope that the  
649 species will be able to recover without several different types of active management.  
650 It therefore seems prudent to proceed with one or more large scale projects provided that  
651 there is an intensive field monitoring and adaptive management process.

652       Since much of the proposed habitat restoration activities will likely occur in  
653 Suisun Marsh and the north Delta, we propose that new habitat projects try and emulate  
654 key aspects of these regions. Based on our analyses, some general suggestions are  
655 provided in Table 4. Note that these habitat features are not intended as the sole design  
656 criteria for this species. A given project will fail if the constructed habitat if it is subject  
657 to periodic water quality issues such as low dissolved oxygen, pesticides, and toxic algal  
658 blooms, or high levels of predators or invasive species. In general, maintaining high  
659 levels of variability and complexity has been suggested as a key approach to promote  
660 native fishes (Moyle and others 2010).

661

662 ***Habitat restoration is highly vulnerable to several factors.***

663  
664       The vulnerability of habitat restoration to future climate change was discussed  
665 above. However, even under limited climate change there are many factors than can  
666 undermine the value of habitat for delta smelt. Of primary concern is the effect of alien  
667 species, given the high level of invasions in the estuary (Cohen and Carlton 1998).  
668 Submerged aquatic vegetation such as Egeria can quickly colonize shallow areas of the  
669 Delta (Brown and Michniuk 2007), covering shallow open water areas that provide part  
670 of the habitat for delta smelt. A notable local example is Decker Island, where a  
671 restoration project was constructed next to a known “hot spot” for delta smelt, yet the  
672 small dendritic channels were rapidly choked with Egeria. SAV is especially attractive to  
673 invasive predators (Grimaldo and others 2004; Brown and Michniuk 2007), that create  
674 mortality risks for delta smelt. However, SAV is not necessary for predator colonization  
675 as recently-created open water areas such as Liberty Island now support large numbers of  
676 striped bass and inland silverside. In addition, it is possible that new habitat projects may  
677 be subject to harmful algal blooms or localized runoff problems. The bottom line is that  
678 delta smelt habitat restoration may be hard to achieve since there are many pitfalls.  
679 Careful site selection and design coupled with intensive monitoring will be needed to  
680 minimize these risks.

681  
682 ***Bet hedging is critical***

Our review of the habitat needs of delta smelt reveals substantial uncertainty about specific features that will support this fish. Given the high level of uncertainty, a sensible approach is to adopt a “bet hedging” strategy coupled with intensive monitoring and evaluation. Of particular importance is the development of habitat projects in more than one geographic area that include multiple habitat types. This is critical given the projection for future climate change (Wagner and others 2011; Cloern and others 2011), the vulnerability of the Delta to floods and earthquakes (Mount and Twiss 2005; Moyle 2008), and the apparent diversity of delta smelt life histories. An emerging story is that the delta smelt do not undergo uniform upstream migration of adults followed by downstream migration of juveniles into the low salinity zone (Sommer and others 2011a). The year-round presence of delta smelt in the north Delta region is evidence of divergent migration pathways (Sommer and others 2011a). Indeed, new otolith research by Hobbs (2010) suggests that the range of life histories includes freshwater spawning/freshwater rearing, freshwater spawning/brackish rearing, brackish spawning/brackish rearing with multiple variations in the specific timing. Again, this means that a single habitat type or region should not be the focus of habitat restoration for delta smelt.

*Processes may be more important than specific habitat features*

Habitat restoration projects typically try and maximize the specific features that the target species prefers. Obviously, this is a key first step as fishes like delta smelt cannot colonize a habitat unless its basic environmental needs are met. Unfortunately, this can result in over-engineering of habitats, something that may not be justified given

the high level of uncertainty about delta smelt habitat and the future of the delta. We propose that an increased emphasis on processes may be more successful than the construction of well-engineered “gardens”. Key processes include sustainability and food web subsidies across habitats.

With regard to sustainability, habitats need to be designed to accommodate anticipated changes that will occur over the next century and beyond. Key changes include a declining sediment load (Wright and Schoellhamer 2004) that will strongly affect accretion and degradation rates of delta habitats, and sea level rise which is expected to eventually submerge many lower elevation sites. Careful selection of sites to progressively accommodate sea level rise is therefore a high priority. The declining sediment load is more problematic, but locating restoration areas in sites with relatively higher sedimentation or re-suspension rates may help to alleviate problems.

Although most of the carbon inputs to the food web appear to be from riverine inputs (Jassby and Cloern 2000; Kimmerer 2004), there is a growing ecological recognition that there may be substantial localized inputs across adjacent habitats. This is certainly the case with Yolo Bypass, which exports primary and secondary production to downstream areas (Schemel and others 2004; Sommer and others 2004b). Liberty Island may also export production during some seasons (Lehman and others 2010b). However, some areas such as SAV habitat in other parts of the Delta show evidence of being trophically decoupled from offshore food webs (Grimaldo and others 2009b), so few subsidies are expected across these habitats. The degree to which tidal marsh habitat may subsidize adjacent pelagic habitat remains unclear (Brown 2003), but there is some evidence that marsh exports could be important. In general, phytoplankton and



zooplankton levels are higher in small channels surrounded by dense emergent vegetation in Suisun Marsh (Rob Schroeter, UC Davis, unpublished data). This may be more a function of longer residence time in these low order channels, but marsh subsidies are also likely. In any case, it seems wise to consider habitat projects in locations where trophic subsidies are most likely (Jassby and Cloern 2000).

*Several key studies are needed*

As suggested previously, delta smelt habitat restoration will not succeed unless there is a sufficiently high level of monitoring and research. Moreover, these types of studies are needed immediately in order to learn from existing habitat use by delta smelt, and to develop baseline data and methodologies to evaluate project success. With respect to habitat use, we have learned quite a bit about the basic needs of delta smelt from long-term monitoring and laboratory studies, but we expect that much more information would be gained from efforts designed specifically to assess habitat use. Specifically, stratified randomized sampling methods are a more statistically defensible way to assess habitat use than fixed stations and can be customized to evaluate habitat types and features not covered by the existing monitoring network. Such surveys would be a useful supplement to the existing long term monitoring conducted in the estuary. Initial efforts should be focused on locations such as Suisun Marsh and the Cache Slough Complex, the two major target areas for restoration and existing “hot spots” for delta smelt.

An ongoing issue for the study of delta smelt habitat has been that this listed species is rare and fragile, so “take” is generally a concern. This means that we are

unlikely to be able to greatly increase our sampling efforts in areas where delta smelt are common. A major priority is therefore the development of improved telemetry, marking and imaging techniques to minimize take of delta smelt. In the short term, perhaps the most promising method is the use of underwater cameras. There are currently studies investigating the use of a towed net fitted with a camera at its (open) cod end (Baxter and others 2010). The camera and associated image processing software were successfully used in fall 2011 to identify and record delta smelt in several locations of the low salinity zone. Such methods may allow much more intensive sampling of different habitats without incurring high mortality. Better use of samples from the existing monitoring program using novel approaches such as otolith microchemistry may provide additional insight into delta smelt habitat use and migration patterns (Hobbs and others 2007; Hobbs 2010).

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1159 Society (B) 73(1):3-36  
1160

1161 Table 1: Generalized additive modeling (GAM) delta smelt results for the 20 mm survey  
 1162 including Temperature (T), Specific Conductivity (C), Secchi depth (S), and Calanoid  
 1163 Copepod Density (F). The variances in each model were all statistically significant  
 1164 ( $P < 0.00001$ ) based on approximate Chi square tests.

1165

Model	Residual Deviance (Percentage of total explained in parentheses)
T	5158 (7.1)
T + C	4876 (12.2)
T + C + S	4640 (16.4)
T + C + S + F	4514 (18.7)

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1168

1169 Table 2: Substrate use by delta smelt as sampled by six core USFWS beach seine  
 1170 stations in the west Delta since 1993 (see text for details). The Chi-square analysis  
 1171 excluded vegetated substrate because it included no catch, which violates the assumption  
 1172 of that test.

1173

Substrate	Samples with delta smelt	Total samples (effort)
Gravel	6	338
Mud	39	2483
Pavement	6	2508
Sand	116	6945
Vegetation	0	183

1174 Chi square = 29.15, DF = 3,  $p < 0.001$  (Excluding vegetation)

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1177

1178 Table 3: Habitat types in which delta smelt have been collected: \*= rare; \*\*=periodic,

1179 \*\*\* = common. As noted in the text, historical observations do not ensure that newly

1180 created habitats will support delta smelt.

Region	Habitat	Present	Comments	Sources
<b>Marine</b>  Examples: Lower Napa River, San Pablo Bay	-Bay  -Channel  -Marsh	*  *  **	Generally only during high flow events.  Collections adjacent to Napa marshes.	Bennett (2005); Hobbs and others (2007); DFG Bay Study & Townet Survey.
<b>Brackish</b>  Examples: Suisun Bay, West Delta	-Bay  -Channel  -Marsh	***  ***  **	Core habitat.  Core habitat.  Collections adjacent to Suisun Marsh.	Moyle and others (1992); Aasen (1999); Bennett (2005); Feyrer and others (2007); Dege and Brown (2004); Sommer and others (2011a); UCD Suisun Marsh Survey (unpubl).
<b>Freshwater</b>  Examples: Sacramento River, Cache Slough, Sacramento Deep Water Ship Channel.	-Non-tidal  -Tidal channel  -Littoral  -Emergent marsh.  -SAV	*  ***  ***  ?  *	Rare, highly seasonal.  Primarily North Delta.  Primarily North Delta.  Little sampling.  Collections adjacent to SAV.	Aasen (1999)  Grimaldo and others (2004); Nobriga and others (2005); Sommer and others (2011a); DFG Fall Midwater and Kodiak Trawls; FWS Juvenile Salmon & Liberty Surveys (unpubl); This Report.

1181

1182 Table 4: Suggested habitat features for pilot delta smelt restoration projects. See text for  
 1183 details.  
 1184

Habitat Feature	Comments	Citations
<i>Low salinities</i> <ul style="list-style-type: none"> <li>Typically &lt;6 psu</li> </ul>	The best-studied variable that defines the habitat of delta smelt.	Bennett (2005) Feyrer and others (2007) Kimmerer and others (2009)
<i>Moderate temperatures</i> <ul style="list-style-type: none"> <li>7-25° C</li> </ul>	The upper temperature limits appear consistent for laboratory and field studies, but tolerance is strongly affected by food availability and acclimation conditions. Lower limits have not been studied in detail, but stress from very low temperatures is likely.	Swanson and others (2000) Bennett (2005) Nobriga and others (2008) Bennett and Burau (2010)
<i>High turbidity</i> <ul style="list-style-type: none"> <li>&gt;12 ntu</li> </ul>	Regions with shoal habitat and high wind re-suspension may help maintain high turbidities.	Feyrer and others (2007) Grimaldo and others (2009a)
<i>Sand-dominated substrate</i>	May be useful as spawning substrate.	This report.
<i>At least moderately tidal</i>	Delta smelt are only rarely observed outside tidal areas.	This report.
<i>High copepod densities</i>	Delta smelt survival appears to be linked to higher levels of calanoid	Nobriga (2002)



	copepods in the low salinity zone.	Moyle (2002)  Kimmerer (2008b)
<i>Low SAV</i>	The absence of delta smelt in most SAV sampling indicates that submerged vegetation degrades habitat value.	This report.  Grimaldo and others (2004)  Nobriga and others (2005)
<i>Low Microcystis</i>	The absence of delta smelt in areas with periodic Microcystis levels indicates that these blooms degrade habitat values.	Baxter and others (2010)  Lehman and others (2010)  This report.
<i>Open water habitat adjacent to long residence time habitat (e.g. low order channels; tidal marsh).</i>	This concept has not been tested statistically, but the frequent occurrence of delta smelt in these habitats suggests that it may be important.	Aasen (1999)  This report.

1185

## Figure Legends

Figure 1. The San Francisco estuary including key landmarks noted in the text. The Delta is the area between Chipps Island, Sacramento, and just south of Stockton.

Figure 2. Locations of USFWS beach seine sampling in Liberty Island. The stations starting counter clockwise from the southeast corner of the site are: Liberty Island East #1-5 and Liberty Island #1-5. The data show the percentage of samples with delta smelt in different parts of Liberty Island based on data from August 2002- October 2004 (n = 607 hauls).

Figure 3. Summary of the extent of delta smelt habitat for four surveys: FMWT, SKT, 20 mm, and TNS. The data are for 2002-2010, when all surveys were conducted. The lines show the upstream and downstream limits of catch for wet (left panel) and dry (right panel) years based on the distance from the Golden Gate Bridge. The circles represent the center of distribution for each survey (see text and Sommer and others 2011a). Note that the surveys do not include inshore habitat or locations around the periphery of the estuary (e.g. Liberty Island, upper Deep Water Ship Channel).

Figure 4. Generalized additive (GAM) model predictions of delta smelt occurrence in the 20 mm survey (based on all four habitat variables) verses the habitat variables for: a) water temperature; b) specific conductivity; c) Secchi depth; and d) calanoid copepod density.

1209

1210 Figure 5. Distribution of catch of delta smelt across seasons in Liberty Island based on

1211 USFWS beach seine data from August 2002- October 2004 (n = 93 fish).

1212

1213 Figure 6. Percentage of beach seine samples with delta smelt in different parts of Liberty

1214 Island (ten “LI” stations) as compared to five core west and north Delta sites. Analyses

1215 are based on USFWS beach seine sampling in these locations during August 2002-

1216 October 2004. The locations of the Liberty Island stations are shown in Figure 2. The

1217 differences between the Liberty Island and core Delta stations were not significantly

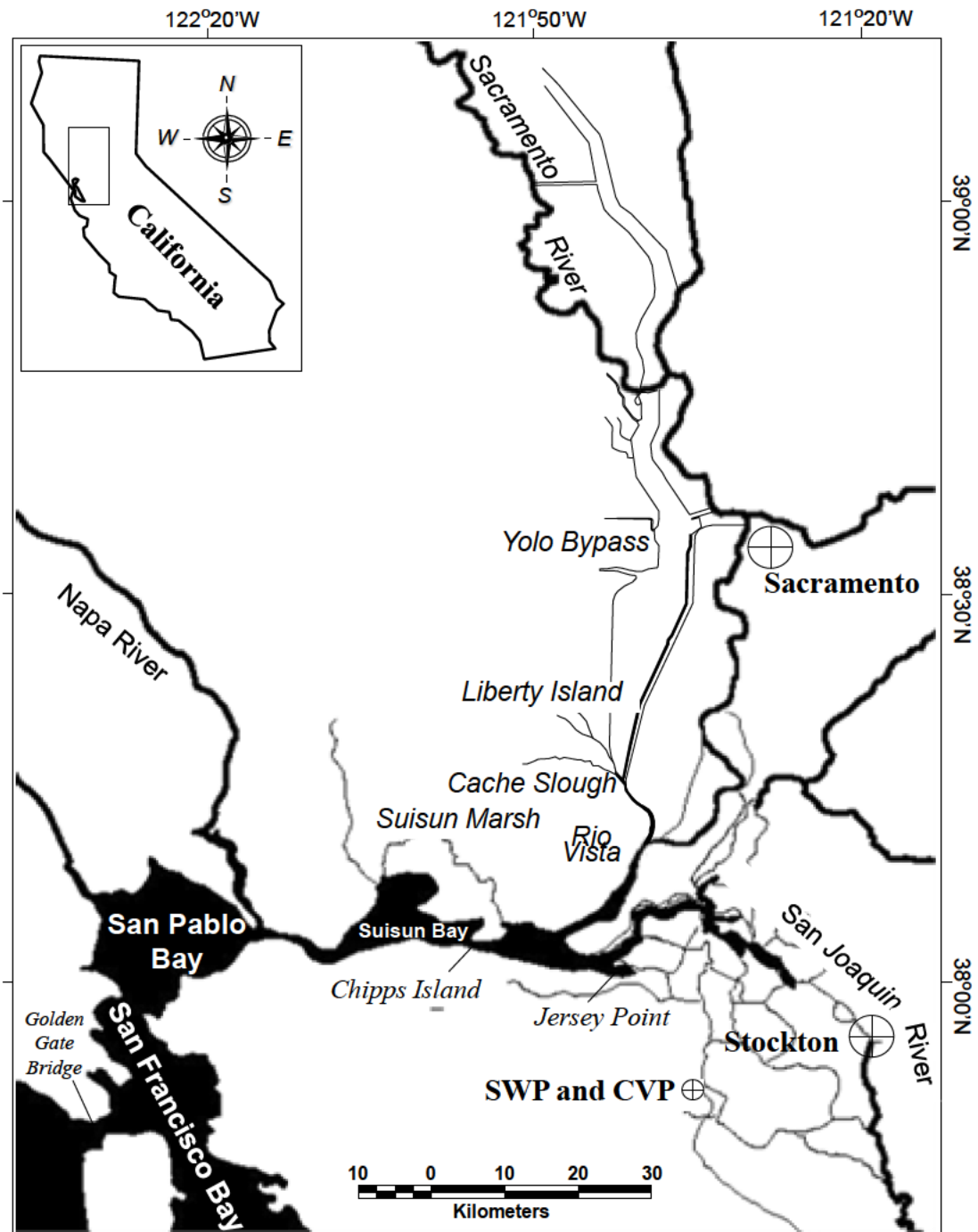
1218 different based on a Kruskal-Wallis test ( $p=0.065$ ).

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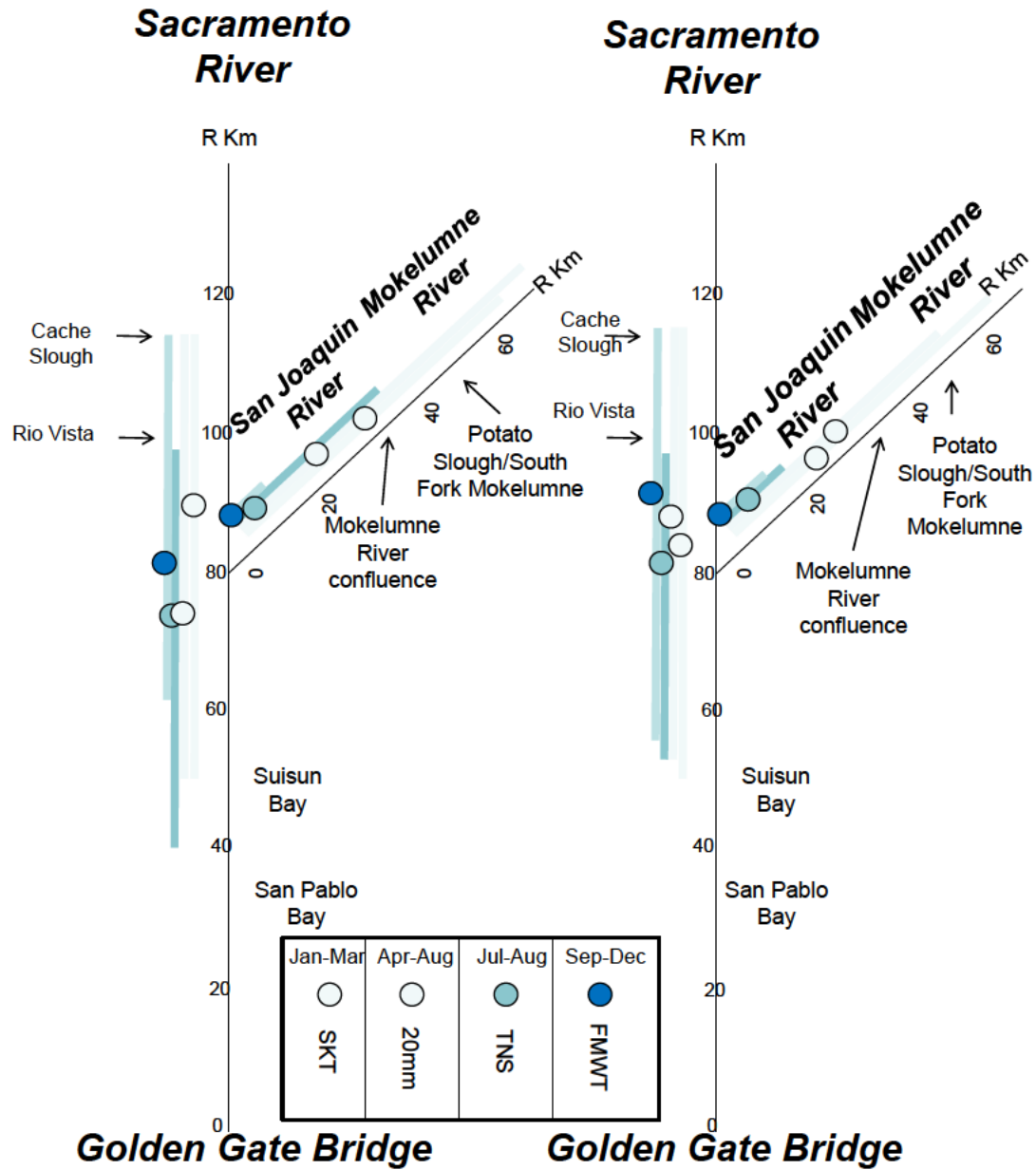
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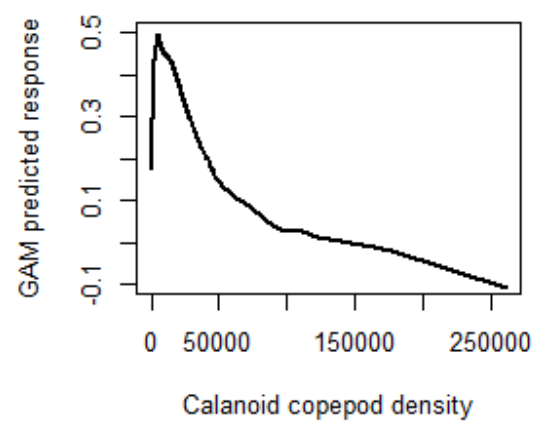
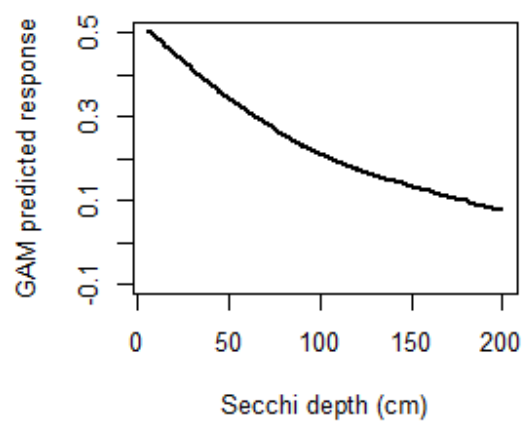
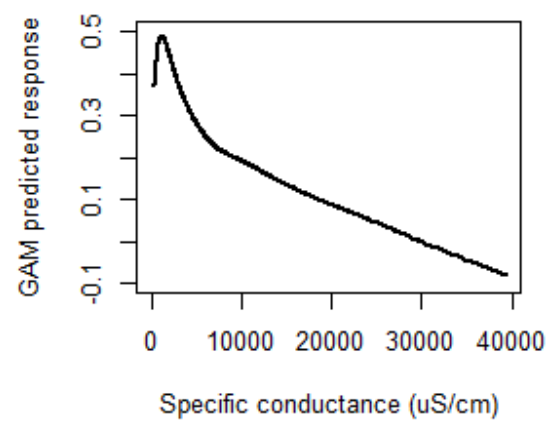
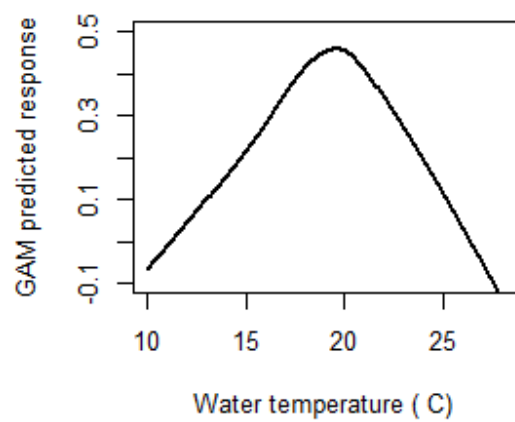
## WET YEARS

## DRY YEARS



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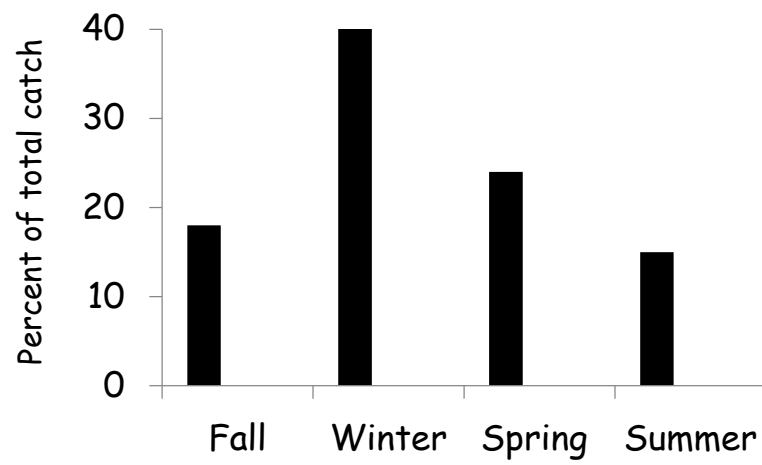
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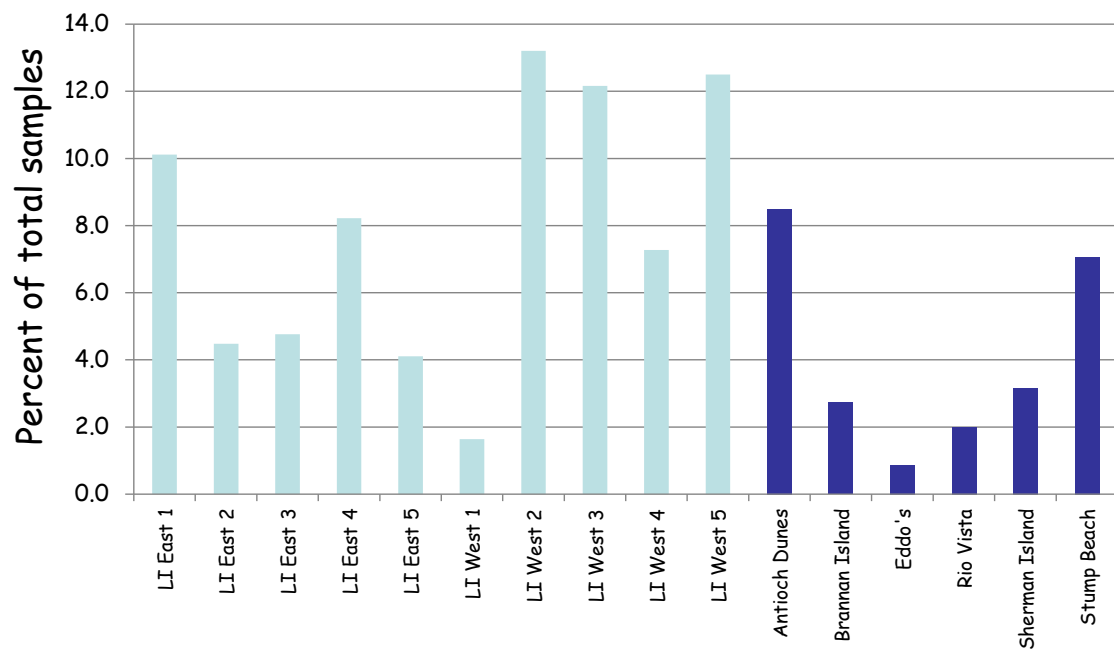
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**From:** Valerie Connor

**Sent:** Thursday, May 24, 2012 11:24 AM

**To:** Simonek,Laura J; Jerry Johns; Jason Peltier; Becky Sheehan; BJ Miller; Brenda Burman; David Fullerton; Dennis Murphy; Frances Brewster; lara; laura; Lloyd Fryer; Lynda Smith; M Ward; Rick Sitts; Sheila Greene; Tom Mongan; Valerie Connor

**CC:** Byron Buck; Hamilton, Scott

**Subject:** FW: Delta Smelt Habitat Paper Submitted

**Attachments:** Sommer Delta Smelt Habitat Paper Submitted 5 2012.pdf

Here is Ted's smelt manuscript.

Lloyd and Dennis,

Can you refresh our collective memories on this. How many of our original concerns persist? Why don't they cite Hamilton and Murphy or Merz and Hamilton?

I rode the train with Ted Sommer this morning and had a great discussion on where "we" all agree. He said that many agency disbelievers now understand the significance of food. The MAST analysis points out that food was a major driver for smelt even before the fall. The comparison of 2010-11 with 2005-6 also points out the importance of summer temperatures. Even with high flows smelt do poorly when they are cooked.

We need to submit comments on this manuscript, but I'd like to take the JFF approach that was used in Lloyd's review of the POD synthesis report. I will ask Sam Luoma if I can provide a review of the paper to him (and Ted).

Valerie Connor, PhD

Science Program Manager

State and Federal Contractors Water Agency

1121 L St., Suite 806

Sacramento, CA 95814

office: (916) 476-5053

cell: (530) 219-9295

VConnor@sfcwa.org

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**From:** Simonek,Laura J [mailto:[lsimonek@mwdh2o.com](mailto:lsimonek@mwdh2o.com)]

**Sent:** Thursday, May 24, 2012 10:43 AM

**To:** Valerie Connor

**Cc:** [jpeltier@westlandswater.org](mailto:jpeltier@westlandswater.org)

**Subject:** FW: Delta Smelt Habitat Paper Submitted

Val: Good morning. Can you distribute to the tech team. Let's get a review if possible. Thanks! L

---

**From:** Jason Peltier [<mailto:jpeltier@westlandswater.org>]

**Sent:** Thursday, May 24, 2012 7:07 AM

**To:** T Birmingham; Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Burman,Brenda W; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; [frances.mizuno@sldmwa.org](mailto:frances.mizuno@sldmwa.org); Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Simonek,Laura J; LLOYD Fryer; 'Martin McIntyre'; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Patterson,Roger K; Rose Schlueter; Sheila Greene; Arakawa,Stephen N; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** FW: Delta Smelt Habitat Paper Submitted

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**From:** Jerry Meral [<mailto:jerry.meral@resources.ca.gov>]  
**Sent:** Wednesday, May 23, 2012 7:52 PM  
**To:** King Moon, Laura; [rpatterson@mwdh2o.com](mailto:rpatterson@mwdh2o.com); [jpeltier@westlandswater.org](mailto:jpeltier@westlandswater.org)  
**Cc:** Karla Nemeth; Carl Wilcox  
**Subject:** FW: Delta Smelt Habitat Paper Submitted

I think this will help with our habitat efforts.

Jerry

---

**From:** Sommer, Ted [<mailto:tsommer@water.ca.gov>]  
**Sent:** Monday, May 21, 2012 10:23 AM  
**To:** Jerry Meral  
**Cc:** Messer, Dean F.; Spaar, Stephani; McEwan, Dennis  
**Subject:** Delta Smelt Habitat Paper Submitted

Jerry,

Thanks for your patience on the delta smelt habitat white paper. I wanted to let you know that I submitted the attached paper today to the journal San Francisco Estuary and Watershed Science. I was able to take advantage of quiet BDCP week (i.e. no long reviews), plus I finally got the material I needed from my co-author, who left DWR this fall to go back to grad school.

Note that I had already provided copies of the last draft to the BDCP consultants, who incorporated some of the information into their analyses.

Don't hesitate to let me know if you have any questions.

Regards,

Ted Sommer, PhD  
Program Manager II  
California Department of Water Resources  
3500 Industrial Blvd  
West Sacramento CA 95691-6521  
Mailing Address: PO Box 942836  
Sacramento CA 94236-0001  
Tel: 916-376-9772

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**A Place To Call Home:**  
**A Synthesis of Delta Smelt Habitat in the Upper San Francisco Estuary**

Ted Sommer and Francine Mejia  
*California Department of Water Resources, Division of Environmental Services, P.O.*  
*Box 942836, Sacramento, CA 94236-0001, USA*

Corresponding Author: [tsommer@water.ca.gov](mailto:tsommer@water.ca.gov)

*Abstract.* We used a combination of published literature and field survey data to synthesize the available information about delta smelt *Hypomesus transpacificus*, a declining native species in the San Francisco estuary. Delta smelt habitat ranges from San Pablo and Suisun bays to their freshwater tributaries, including Delta and the Sacramento and San Joaquin rivers. In recent years, substantial numbers have colonized habitat in Liberty Island, a north Delta area which flooded in 1997. The species has more upstream distribution during spawning periods and a more downstream distribution during wetter years. Delta smelt are most common in low salinity habitat (<6 psu) with high turbidities (>12 ntu) and moderate temperatures (7-25°C). They do not appear to have strong substrate preferences, but sandy shoals may be important for spawning. The evidence to date suggests that they generally require at least moderately tidal habitats. Delta smelt also occur in a wide range of channel sizes, although they seem to be rarer in small channels (<15 m wide). Nonetheless, there is some evidence that open water habitat adjacent to long residence time areas (e.g. tidal marsh, shoal, low order channels) may be favorable. Other desirable features of delta smelt habitat include high calanoid copepod densities, and low levels of submerged aquatic vegetation and the toxic algae *Microcystis*. While enough is known to plan for large scale pilot habitat projects, these efforts are vulnerable to several factors, most notably climate change, which will change salinity regimes and increase the occurrence of lethal temperatures. We recommend a “bet hedging” approach coupled with extensive monitoring and adaptive management. An overall emphasis on ecological processes rather than specific habitat features is also likely to be most effective.

## Introduction

The San Francisco Estuary is one of the prominent features of the California coastline. The estuary is both unconventional and complex, supporting diverse habitats ranging from marine bays to brackish marshes and tidal freshwater wetlands. Given the extreme level of urbanization and hydrologic alteration of the estuary, it is therefore not surprising that identifying and protecting the habitats of endemic plants and animals has become one of the major resource management issues in the San Francisco Estuary (Figure 1). Habitat increasingly has become a target of management and restoration as a result of declines in multiple trophic levels. Of the various declines, the highest-profile has been the collapse of the pelagic fish community of the upper San Francisco estuary (Sommer and others 2007). Indeed, few regional fisheries issues have generated as much debate as the habitat requirements of delta smelt *Hypomesus transpacificus*, a native osmerid that occurs only in the low salinity zone of the system. The population has declined precipitously over the past decade, leading to major legal and regulatory actions to try and improve its status (Service 2007; Sommer and others 2007). The species is currently listed as Threatened under the Federal Endangered Species Act and Endangered under the California Endangered Species Act (USFWS 2008).

This annual species is confined to a single estuary, so maintenance of the population depends in part on habitat conditions in the Sacramento-San Joaquin Delta (herein referred to as the *Delta*), the upstream region of the San Francisco Estuary from which the species gets its name (Figure 1). The hydrodynamics of the Delta's highly interconnected channels are especially complex and highly altered, with major changes to

key parts of the distribution of delta smelt. One of the biggest hydrologic changes over the past century has been the construction of the large Central Valley Project (CVP) and State Water Project (SWP) water diversions, which supply water to about 25 million California residents and a multi-billion dollar agricultural industry (Grimaldo and others 2009).

Given its legal status, there has been substantial progress in understanding the life history of this species (Moyle and others 1992; Bennett 2005; Nobriga and Herbold 2009). The typical pattern is for delta smelt to inhabit the oligohaline to freshwater portion of the estuary for much of the year until late winter and early spring, when they migrate upstream to spawn (Sommer and others 2011a). Following hatching, their young subsequently migrate downstream in spring towards the brackish portion of the estuary (Dege and Brown 2004). Some of the key physiological and environmental requirements are understood based on laboratory studies and analyses of field data (Swanson and others 1998, 2000; Baskerville-Bridges and others 2004; Feyrer and others 2007; Nobriga and others 2008).

The primary objective of this paper was to synthesize the available information about the habitat of delta smelt and to provide insight into what may happen in the future. Although there are multiple definitions of habitat, we have chosen to consider delta smelt habitat as the physical, chemical, and biological factors in the aquatic environment of this species (Hayes and others 1996). Moreover, we assume that the maintenance of appropriate habitat quality is essential to the long-term health of delta smelt (Rose 2000; Peterson 2003). We emphasize that this does not mean that this report assumes that habitat is the primary driver of the delta smelt population. To the contrary, there is

91 substantial evidence that delta smelt are controlled by a complex set of multiple  
92 interacting factors (Sommer and others 2007; Baxter and others 2010; MacNally and  
93 others 2010). Therefore, it should not be assumed that providing good habitat conditions  
94 now or in the future will guarantee delta smelt success. In ecological terms, this issue is  
95 often considered in terms of the *realized* versus *fundamental* niche of a species. Having  
96 lots of suitable habitat creates the potential for delta smelt to occupy a large area (i.e.  
97 *fundamental niche*), but the *realized* distribution may be much smaller because other  
98 factors (e.g. predators) limit their ability to use all of the available area. In other words,  
99 habitat is a necessary but not sufficient condition to support delta smelt. Habitat is,  
100 nonetheless, unique in that it not only directly affects the species of interest (delta smelt),  
101 but all affects other population drivers including “top-down” and “bottom-up” effects.  
102 As such, it provides an excellent useful starting point for evaluating the ecological status  
103 of species and potential restoration options.

104 A key point in evaluating delta smelt habitat is that it needs to be considered in two  
105 different ways. First, it can be considered in a geographical context based on fixed  
106 regions of the delta that seem to be important for delta smelt such as the west Delta,  
107 Suisun Bay, and Cache Slough Complex. Because the estuary is strongly tidal and delta  
108 smelt are a pelagic fish strongly associated with distinct salinity ranges (Dege and Brown  
109 2004; Feyrer and others 2007; Kimmerer and others 2009), its habitat must also be  
110 considered as constantly shifting in position along the axis of the estuary. In physical  
111 science terms, the former is the Eulerian frame of reference, while the later is the  
112 Lagrangian frame of reference.



For the purposes of this study, we focused on the following major questions: 1) what are the basic physical, chemical, and biological requirements for delta smelt habitat? 2) What geographic areas currently provide these conditions? 3) What habitat types support delta smelt? 4) Given factors such as climate change, will the upper estuary provide suitable conditions in the future? With respect to the last question, a second major objective of the study was to identify which areas and habitat features will improve the survival chances of delta smelt. Hence, our analysis was clearly targeted at providing direction for large scale restoration efforts being considered under programs such as the Bay Delta Conservation Plan (BDCP) and recent Biological Opinions (FWS 2008).

Because of the limited nature of the data available on delta smelt, our study was not intended as a “bible” for their habitat. Specifically, our synthesis does not provide detailed description of what delta smelt require for any single factor, habitat, or geographic area. Moreover, we focus on the direct habitat needs of delta smelt, but do not substantially address the role of subsidies across habitats that this fish do not necessarily occupy (e.g. tule marsh contributions to the smelt food web). Our goal was therefore to provide a basis for generating testable hypotheses for future restoration and research projects. Given the rarity of delta smelt and associated constraints on field collection, we also hoped that our analyses of existing data would help to set priorities for future studies.

## **Methods and Materials**

Assessing habitat needs of delta smelt is especially challenging because the fish is very small (usually <100 mm FL), fragile, increasingly rare, and has a protected legal status (Moyle 2002; Bennett 2005). A related issue is that the San Francisco estuary is vast and spatially complex, with multiple tributaries, embayments, and braided channels (Figure 1). High turbidity levels in the estuary present major challenges to direct observations of habitat use. As noted previously, the need to evaluate smelt habitat in both Lagrangian (moving flow field) and Eulerian (fixed locations) frames of references complicates the interpretation of the available data. Finally, observational data on different habitats can yield ambiguous or even misleading results. For example, juvenile Chinook salmon densities are consistently higher along the narrow rip-rapped edge of the Sacramento River than in the broad expanses of the adjacent Yolo Bypass floodplain (Ted Sommer, California Department of Water Resources, unpublished data). In other words, care must be used to correct observational data for habitat availability.

Several of these issues meant that currently it is not feasible to use traditional habitat assessment techniques such as telemetry, mark-recapture, or visual observation. We therefore relied on a combination of published literature, data analyses from long- and short-term fisheries surveys, and the expert opinion of colleagues to synthesize the available information with delta smelt. There is no question that our approach has a higher uncertainty than direct observational methods; however, the information represents the best available given the many constraints. Although our synthesis does not follow the format of a traditional scientific paper, similar efforts to integrate multiple information sources have proven useful to guide subsequent research and restoration (e.g. Moyle and others 2004).

## *Data Sources*

*Literature:* We focused on peer-reviewed literature, the majority of which was from the San Francisco estuary and about delta smelt. For topics with no journal publications, we also included some agency reports and unpublished manuscripts.

*Long-term surveys:* The following describes several of the key Interagency Ecological Program monitoring surveys that collect delta smelt. Several of the descriptions are from Sommer and others (2011a) and are presented approximately in ontogenetic order starting with larvae.

Initiated in 1995, the California Department of Fish and Game (DFG) 20 mm survey typically samples larvae during each neap tide between March and July (Dege and Brown 2004). A total of 48 sites have been sampled continuously and include freshwater to mesohaline habitats of the estuary. Three 10-min oblique tows are conducted at each location using a 5.1-m long, skid mounted net with a 1.5 m<sup>2</sup> mouth, a 1.6 mm mesh body and a removable 2.2 L cod end jar. Zooplankton tows were collected simultaneously using a Clarke-Bumpus net (0.160 mm mesh nylon cloth, outer mouth diameter of 12.5 cm, 76 cm length with a cod-end screened with 0.140 mm mesh) Volume was recorded with a General Oceanics model 2030 flow meter. Zooplankton samples were preserved in 10% formalin with Rose Bengal dye. Preserved samples were concentrated in the laboratory by pouring them through a sieve screened with 0.154 mm mesh wire, rinsed, then reconstituted to organism densities of 200-400 per milliliter. A 1 milliliter subsample was then extracted and counted and identified in a Sedgewick-Rafter cell. For

the purposes of this study we focused on counts of calanoid copepods, a key food source for delta smelt (Nobriga 2002; Bennett 2005).

The Summer Townet Survey (TNS) has been conducted annually by DFG 1959. The survey was designed to index the abundance of age-0 striped bass, but also collects delta smelt data that have been used to analyze abundance, distribution, and habitat use (Kimmerer 2002; Bennett 2005; Nobriga and others 2008). The TNS samples up to 32 stations using a conical net (1.5 m<sup>2</sup> mouth; 2.5 mm cod-end mesh) towed obliquely through the water column.

The DFG fall midwater trawl (FMWT) samples fishes in open-water and other offshore habitats monthly each September to December at 116 stations throughout the northern region of the estuary. The survey at each location takes a 10 to 12-minute tow with a 13.4 m<sup>2</sup> midwater trawl of variable meshes starting with 20.3 cm mesh at the mouth of the net and 1.3 cm mesh at the cod end (Feyrer et al. 2007). The survey represents one of the best long-term fishery data sets for the San Francisco estuary and covers the majority of the range of delta smelt. The FMWT samples delta smelt distribution and relative abundance during the period leading up to, but not including their spawning migration. Thus, it provides a long-term dataset on where delta smelt are distributed in the estuary. The survey has been conducted since 1967 with the exception of 1974 and 1979.

The DFG Spring Kodiak Trawl survey (SKT) has been conducted since 2002 as a survey to assess the distribution of adult delta smelt during the time they ripen and spawn (Source: <http://www.delta.dfg.ca.gov/data/skt/>). It samples 39 locations from Napa River upstream through Suisun Bay and the Delta (Figure 1). The survey has been conducted

every 2-4 weeks in winter and spring starting in January or February. At each location, a single 10 minute surface sample is taken by two boats that tow a 7.6 m wide by 1.8 m high Kodiak trawl (mesh ranges in dimension from 5.1 cm knotted stretched mesh at the mouth and decreases by 1.3 cm through a series of 5 panels to 0.6 cm knotless stretched mesh at the cod-end).

The USFWS Beach Seine Survey uses a 12-meter long by 1.2 meter high seine to collect inshore fishes from areas generally less than one meter deep (Brandes and McLain 2001). Seine hauls are conducted year-round at 57 current sampling stations from San Francisco Bay upstream to the lower Sacramento and San Joaquin Rivers. Unlike most other surveys, basic substrate data is collected for this program. In addition to the core USFWS, we examined data from special surveys in Liberty Island, a flooded tidal wetland in the Cache Slough Complex. The surveys during August 2002-October 2004 used similar methods as the regular USFWS Beach Seine program at ten core sites located around the periphery of the lower portion of the island (Figure 2).

*Short-term and geographically-limited studies:* One of the key studies used to identify habitat use by delta smelt was the DFG Delta Resident Fishes Survey (Brown and Michniuk 2007). This survey used an electrofishing boat to sample 200-m reaches of shoreline spread across several delta regions. The timing of this survey has been sporadic, with sampling that collected delta smelt in 1981-1982, 1995-1997, and 2001-2003.

Another source of data about delta smelt use of small channels was the California Department of Water Resources Yolo Bypass study, which includes larval sampling and rotary screw trapping. This sampling occurred near the base of Yolo Bypass in a 40 m

wide perennial channel. Methods for the two surveys are summarized in Sommer and others (2004a) and Feyrer and others (2006).

*Data Analyses:* Delta smelt are a relatively rare and patchy fish, so most survey data were summarized based on presence-absence data. To summarize the general locations of delta smelt habitat by life stage, we summarized the upstream and downstream distribution limits for each of the major surveys: FMWT, SKT, 20 mm, and TNS. The center of distribution was calculated for each survey (Sommer and others 2011b). Data were summarized separated for wet and dry years using all years since 1995, when all four surveys were conducted.

For several analyses, we calculated the percentage of samples with delta smelt present for under different conditions (e.g. substrate, geographic locations). Where possible, we did statistical analyses. For example, we used this approach for USFWS beach seine data to compare delta smelt habitat use in Liberty Island as compared to concurrently collected data from the core west and north Delta station region where the population is often centered (Sommer and others 2011a; Figure 3). We focused on six west and north Delta stations (Sandy Beach SR012W; Stump Beach SR012E; Rio Vista SR014W; Brannan Island TM001N; Eddo's SJ005N; Sherman Island MS001N; Antioch Dunes SJ001S) that commonly catch delta smelt. Differences in percent of samples with delta smelt were compared for the Liberty Island (Figure 2) and the core Delta sites during the same sampling period (2002-2004) using a Kruskal-Wallis test. The USFWS beach seine data for the core Delta stations were also used to evaluate substrate use. Only data after 1993 were used because they included substrate information (mud, pavement, vegetated, sand, gravel). We did a Chi-square test comparing the number of samples in which delta

smelt were captured on each substrate type to the total samples (i.e. effort) on each substrate type. However, we acknowledge that fixed stations are not an optimal approach to habitat use. One concern about the use of fixed stations is that salinity-induced shifts in the distribution of delta smelt along the axis for the estuary, which may “push” delta smelt away from or towards certain substrate types.

Food was analyzed for the 20 mm survey, the only IEP sampling program which collects data simultaneous with fish at each station. As others have shown, generalized additive models (GAMs) can be used to examine the associations between fish occurrence and habitat variables such as salinity, temperature, and turbidity (Stoner and others 2001; Feyrer and others 2007; Kimmerer and others 2009). We examined whether adding food availability improved the model predictions for delta smelt. The technique uses smoothers to describe the empirical relationships between predictor and response variables and therefore does not assume particular relationships between the two. We used the GAM function in the MGCV package of the statistical program R (R Development Core Team 2011; Wood 2011) with a logit link function to determine whether there were significant relationships between four response variables (mean temperature; mean EC; mean secchi depth; mean calanoid copepod density) and the presence of delta smelt in 20 mm samples for 1995-2009. The variables were tested both individually and in combination with each other. We analyzed the GAM results in two ways. First, we examined whether the smoothed results were congruent with expected responses based on laboratory tests and ecological literature. Specifically, we expected that delta smelt would show a unimodal response to temperature and salinity, a declining occurrence relatively to Secchi (Feyrer and others 2007), and an increasing or saturating

response to food availability (e.g. Holling 1959). Second, we assessed statistical significance of the GAM outputs using an approximation of the ability of each variable to reduce null deviance in the models (Venables and Ripley 1997; Feyrer and others 2007).

## **Delta Smelt Habitat: A Synthesis**

### **Basic Habitat Requirements**

**Salinity:** Salinity is the main factor that defines an estuary, so understanding salinity requirements is an essential in describing the habitat of estuarine organisms. Because of the ease of measurement, salinity is often represented based on electrical conductivity. The two units are not strictly interchangeable because of variation in the ionic composition of different regions of the San Francisco estuary (e.g. oceanic salts vs. agricultural salts in the San Joaquin River).

More so than any other delta smelt habitat variable, salinity has been the subject of intense research and debate. Higher flow levels shift the salt field downstream, as commonly represented by X2, the distance of the 2 psu salinity isohaline from the Golden Gate Bridge (Jassby and others 1995; Kimmerer 2002). There are no long-term trends in the salinity of the upper estuary for most months (Jassby and others 1995; Enright and Culberson 2010); however, there have been salinity increases during fall (Feyrer and others 2007), when the issue has become most controversial.

Delta smelt are strongly associated with the low salinity zone, typically <6 psu or <10,000 uS/cm (Feyrer and others 2007; 2010; Kimmerer and others 2009). Our GAM



results for the 20 mm survey showed a similar pattern (Figure 4; Table 1). The distribution of delta smelt is therefore affected by salinity at multiple life stages. For example, Dege and Brown (2004) found that the center of distribution of young delta smelt during spring was determined by the location of the salt field, with a more downstream distribution during wetter years. Similarly, Sommer and others (2011a) found that the center of distribution of older delta smelt was consistently associated with the location of the salt field (X2) during all months. As will be discussed below, this does not mean that all smelt are confined to a narrow salinity range since fish occur from fresh water to relatively high salinities.

The effects of salinity on habitat area vary seasonally and therefore by life stage. Kimmerer and others (2009) found that X2 had a negative association with habitat area (i.e. higher flow = more area) for all surveys analyzed, but the effect was strongest in spring and summer. They suggest that earlier life stages were more responsive to salinity changes because they tend to occupy fresher water than older delta smelt. Despite a clear effect of estuarine salinity on habitat area, Kimmerer and others (2009) did not observe strong effects on abundance. Feyrer and others (2010) also found a negative effect of X2 on habitat area during the fall. Feyrer and others (2007) report a long-term decrease in habitat area based on the combined effects of salinity and turbidity (as indexed by Secchi depth), and a weak effect of fall conditions on juvenile production the following summer. The significance of these results has been the source of intense debate as part of legal challenges to the USFWS (2008) Biological Opinion for delta smelt, which included new requirements to change X2 during the fall of wet years.

318           **Tides and Flow:** There have been occasional collections of delta smelt upstream  
319 of the tidal zone north of Sacramento (USFWS Juvenile Salmon Survey, unpublished  
320 data). All of these occurred during the winter and spring spawning season. Despite these  
321 rare exceptions, the habitat of delta smelt is focused entirely in the tidal zone. It is not  
322 known if delta smelt can survive in areas without consistent tidal flows as may be the  
323 case for some areas in the future with sea level rise (see below).

324       Delta smelt currently are found in the small channels such as the Yolo Bypass Toe  
325 Drain, where tidal flows are periodically less than  $\pm 4 \text{ m}^3/\text{sec}$  during months when smelt  
326 are present (Lisbon Gauge, Department of Water Resources, unpublished data), to areas  
327 with stronger tides such as Chipps Island, where representative summer tidal flows are  
328  $\pm 9400 \text{ m}^3/\text{sec}$  (DWR 1993). It is highly likely that delta smelt use some form of tidal  
329 surfing to change their location in the estuary (Swanson and others 1998; Sommer et al.  
330 2011a). Bennett and others (2002) provide evidence that young longfin smelt (*Spirinchus*  
331 *thaleichthys*) use tidal surfing to maintain their position in the estuary, so it is reasonable  
332 to assume that a close relative like delta smelt does the same. Sommer and others (2011a)  
333 used a particle tracking model to show that apparent upstream migration rates of adult  
334 smelt were consistent with simulations based on a simple tidal surfing behavior.

335       **Velocity:** Closely related to tides and flow is water velocity. This variable may be  
336 much less relevant to fishes in the highly tidal upper San Francisco estuary than for  
337 species that live in riverine systems. Even in a tidal environment, it is likely that delta  
338 smelt respond to covariates of velocity such as turbulence, so velocity should not be  
339 ignored as a habitat feature.

The effects of water velocity on delta smelt are understood primarily from laboratory studies. Swanson and others (1998) showed that maturing delta smelt probably can swim for long periods at rates of 1-2 body lengths per second, representing about 6-12 cm per second. Critical swimming velocities were around 28 cm/second. These rates were comparable or somewhat lower than similar-sized fishes for the same temperature range.

**Turbidity:** Important progress in our understanding of the habitat needs of delta smelt is that the species requires turbid water. Traditionally, fisheries biologists have viewed high turbidities as a detriment to fish based on extensive evidence that high sediment loads degrade the quality of salmon habitat (Newcombe and Macdonald 2011). This has led to widespread regulations for logging and construction projects along the Pacific Coast to limit sediment loading to rivers. However, Feyrer and others (2007) found that delta smelt are strongly associated with turbid water. Their results showed that during fall delta smelt are only present at locations where Secchi depth is less than 1 meter deep. This finding is consistent with Grimaldo and others (2009a), who found that the occurrence of delta smelt at the SWP salvage facilities was linked, in part, with high turbidities. Specifically, delta smelt were not present when turbidities were less than about 12 ntu. This results are consistent with our GAM analyses of the 20 mm data set, which showed that young delta smelt are strongly associated with lower Secchi depths (Figure 4: Table 1).

The specific mechanism by which delta smelt require high turbidity is not known. An obvious potential function of turbidity is that it may help delta smelt avoid visual predators (Baskerville-Bridges and others 2004; Feyrer and others 2007; Nobriga and Herbold 2009). Light apparently plays a role in feeding ecology as laboratory studies

show that consumption is low in clear water ((Mager 1996; Baskerville-Bridges and others 2004). It is possible that turbidity helps create a contrasting background for delta smelt to locate their prey.

One of the most disturbing long-term changes in for delta smelt has been the increase in water clarity in the upper estuary (Jassby and others 2002; Wright and Schoellhamer 2004; Feyrer and others 2007). Moreover, modeling by Schoellhamer (2011) suggests that there has been a sudden recent (1999) increase in water clarity as the sediment balance shifted. In contrast to other habitat variables such as salinity, these trends are not driven by hydrology (Jassby and others 2002). As noted in Baxter et al. (2010), the primary mechanisms suggested to explain the increasing water clarity are: 1) reduced sediment supply due to dams in the watershed (Wright and Schoellhamer 2004); 2) major flood events (e.g 1982-1983) that washed out large amounts of sediment (Baxter and others 2010); and 3) biological filtering by submerged aquatic vegetation (Brown and Michniuk 2007, Hestir and others In review). Whatever the mechanisms, this change appears to have had a serious effect on habitat quality for delta smelt during both summer (Nobriga and others 2008) and fall (Feyrer and others 2007).

**Temperature:** Upper temperature limits for delta smelt habitat have been relatively well-studied in both the laboratory and using field data. Interpretation of the laboratory results is somewhat complicated as temperature limits can be affected by various factors including acclimation temperature, salinity and feeding status. The general pattern is that delta smelt cannot tolerate temperatures higher than 25°C (Swanson and others 2000), a level that is highly consistent with field collections of young smelt (Nobriga and others 2008) and our GAM results for the 20 mm data set (Figure 4; Table 1). Hence, the 25°C

is currently used at the general guideline to assess the upper limits for delta smelt habitat (Wagner and others 2011; Cloern and others 2011).

The lower limit to water temperature has not yet been evaluated in detail. However, Bennett and Burau (2010) analyzed the occurrence of adult in the Spring Kodiak Trawl based on three water quality variables. Their preliminary results suggest that delta smelt are rare below about 7°C. Note, however, that temperatures below 10°C are uncommon in the estuary (Kimmerer 2004; Nobriga and Herbold 2009).

**Depth:** Like velocity, the relevance of depth to a pelagic fish in a tidal estuary is open for debate. Landscape variables such as depth are, nonetheless, clearly important features that define tidal dynamics such as velocities, excursion, and frequency of inundation. Unfortunately, depth is not recorded for many of the pelagic trawls in the upper estuary making it difficult to evaluate this variable. Some data are available for littoral surveys, but delta smelt catch is generally too low for a rigorous statistical analysis. While generally regarded as a pelagic fish (Moyle 2002), delta smelt are clearly caught in shoal and shallow inshore areas such as Suisun Bay and Liberty Island (Moyle and others 1992; Nobriga and others 2005; Sommer and others 2011a). Aasen (1999) found that juvenile smelt densities can actually be higher in shoal areas than adjacent channels. However, delta smelt use of shallow areas apparently varies with tide (Aasen (1999) and they probably do not substantially use the shallowest tidally dewatered edge areas (Matt Nobriga, USFWS, unpublished data). There does not appear to be an obvious maximum depth for delta smelt as the fish are commonly captured along the Sacramento Deep Water Ship Channel (Grimaldo and others, In prep; DFG Spring Kodiak Trawl:

<http://www.dfg.ca.gov/delta/data/skt/DisplayMaps.asp>), which has most of the deepest habitat in the upper estuary.

**Channel size:** Most data has been collected in large channels, making it difficult to evaluate what types delta smelt prefer. It is likely that channel width itself is not a constraint; instead, delta smelt are likely to be cued into related habitat features such as tidal excursion, velocity, temperature, and turbidity. There does not appear to be a clear upper limit for channel width as the FMWT and TNS data show that delta smelt are common in large channels including broad bays that are several km wide. For example, some of the most numerically important areas for delta smelt catch are Cache Slough, a 200-280 m wide channel (20mm station 716, TNS & FMWT stations 716 and 721) and the Sacramento Deep Water Ship Channel, with a 170-200 m wide channel (TNS and FMWT stations 719 and 797).

The lower limit to channel size for delta smelt has still not been addressed. In the Delta, the smallest channels that we are aware of where delta smelt have been collected are around 45 m wide. One example is a small perennial channel of the Yolo Bypass—both adult and larval stages seasonally were collected there in many years (Sommer and others 2004). Another narrow channel with regular catches of delta smelt larvae is Miner Slough at 45-50 m wide (20 mm station 726). Downstream of the Delta, the smallest channel where adults and juveniles have been reported is Spring Branch Slough in Suisun Marsh, which averages about 15 meters near the sampling area of the UC Davis Suisun Marsh Survey (Meng and others 1994; Matern and others 2002). These fish are most commonly caught during winter, usually January to March (Teejay Orear, UC Davis, unpublished data).

**Food:** Even if physical and chemical requirements are met, delta smelt will not survive if habitat does not contain enough food to support basic metabolic needs. The food source of delta smelt is fairly specialized, relying primarily on calanoid copepods such as *Eurytemora affinis* and *Pseudodiaptomus forbsi* (Nobriga 2002; Moyle 2002). There has been a long-term decline in zooplankton in the upper estuary (Winder and Jassby 2010), which partially may account for the reduction in the mean size of delta smelt in fall (Sweetnam 1999; Bennett 2005). Overall, food limitation remains a major stressor on delta smelt (Baxter and others 2010). The importance of this variable is supported by Kimmerer (2008), who showed that delta smelt survival from summer to fall is related to biomass of copepods in the core range of delta smelt. These relationships have led to the recognition that food availability should be included in life cycle models of delta smelt (Maunder and Deriso 2011).

There is evidence of substantial spatial and temporal variation in copepods in the estuary. The most extensive database for zooplankton of the upper estuary is the IEP's Environmental Monitoring Program (<http://www.water.ca.gov/iep/activities/emp.cfm>), which includes stations in Suisun Bay, Suisun Marsh, and the West and South Delta. *P. forbesi* and *E. affinis* both frequently show their highest densities in the south Delta and Suisun Marsh (Hennessy 2009; Anke Mueller-Solger, unpublished data). *P. forbesi* is most abundant during summer to fall, while *E. affinis* largely disappears from the EMP sites in summer and fall.

From a restoration perspective, one of the more important recent findings has been that food resources are often more abundant around the periphery of the upper estuary. In the brackish zone, the smaller channels of Suisun Marsh frequently show relatively high

levels of chlorophyll *a* and copepods (Schroeter 2008; Anke Mueller-Solger, Delta Science Program, unpublished data). Similarly, studies by Benigno and others (In review) show that the channels of the Cache Slough Complex consistently have higher chlorophyll *a* levels than Delta EMP stations. The data suggest that calanoid copepod levels may be enhanced during key months for delta smelt. Longer residence times are likely a major contributing factor to increased food web production in these regions (Lucas and others 2009).

Food thresholds for delta smelt have not yet been established, although our GAM analyses provide some insights for spring. The GAM results of the 20 mm data set suggested that temperature, salinity, Secchi depth, and calanoid copepod density were all significantly associated with occurrence of young delta smelt (Table 1; Figure 4). However, the smoothed GAM results for calanoid copepods (Figure 4) did not follow the expected increasing or saturating responses (e.g. Holling 1959). Instead, the smoothed response suggested a questionable decline in delta smelt abundance at high calanoid copepod densities. An additional issue is that models that incrementally added each of the environmental variables indicated that adding calanoid copepods to the model explained only a small additional amount of deviance (2%) as compared to models with just the three physical variables (Table 1). These results suggest that calanoid copepod density was not a meaningful predictor of young delta smelt in the 20 mm survey. This does not mean that food is unimportant to young delta smelt; rather, the data may not be at a sufficient scale to detect associations.

**Substrate:** Most fish surveys in the upper Estuary do not record substrate, making it difficult to evaluate the importance of this variable to delta smelt. The relevance of



substrate in the deep channel habitat of delta smelt is questionable; for example, young smelt are typically in the middle or upper portion of the water column, particularly during day time (Rockriver 1994; Grimaldo and others, In review). Nonetheless, substrate may be relevant when delta smelt venture into littoral areas. Delta smelt catches are typically quite low in inshore areas, making it hard to analyze the data in any rigorous way.

The best available data about substrate use are from the USFWS beach seine survey (Table 2). The results suggest at least modest differences between observed and expected habitat use (Chi square = 29.15; DF = 3;  $p < 0.001$ ). Delta smelt were never collected in vegetation, despite 167 samples in such habitats. Habitat use was also much lower than expected at paved locations (boat ramps), but somewhat higher than expected over gravel, mud, and sand.

Another example is the DFG Resident Fishes Survey, which used electrofishing to sample nearshore areas during the early 1980s, mid-1990s, and early 2000s (Brown and Michniuk 2007). The survey did not have high enough catch of delta smelt to warrant statistical analysis. The 1981-1982 data collected delta smelt in 5% of 360 samples over the following substrates: rip-rap 41% of fish; mud bank 59% of fish. These proportions were very similar to the distribution of sampling effort among all sites. Sampling effort was much greater in later years (5,645 samples); however, delta smelt were collected in only 0.4% of samples. These fish were collected over rip-rap (38%), mud bank (47.6%), and sand beach (14.3%), which was somewhat different than the overall sampling effort for all sites (rip-rap 60%; mud bank 33%; sand beach 3%; mud flat 4%).

In general, these data suggest that delta smelt do not have particularly strong substrate preferences, which is not surprising given their niche as a pelagic fish. Nonetheless,

substrate may be an important issue during spawning. The substrate preferences of delta smelt are not known; however, many other smelts are known to favor sandy substrate for spawning (Bennett 2005). This substrate is relatively common in inshore areas of the west Delta (e.g. Sherman Island) and north Delta (e.g. Liberty Island and Sacramento Deep Water Ship Channel).

**Other Water Quality Factors:** The current state of knowledge about the effects of water quality problems including contaminants on delta smelt and other pelagic fishes has recently been summarized by Brooks and others (2011). The evidence to date indicates that although acute contaminant toxicity is not a likely cause for the population declines, sublethal stress from multiple factors including metals, nutrient-rich effluents, toxic algal blooms, and pesticides all degrade the habitat of delta smelt. For example, sublethal contaminant exposure can impair immune function and swimming ability of delta smelt (Connon and others 2011). Delta smelt distribution is known to overlap with several key contaminants (e.g. Kuivila and Moon 2004; Brooks and others 2011) and effects can be substantial depending on the level of exposure (Connon and others 2009).

The highest profile water quality issue has been inputs of ammonium to the Delta, primarily from municipal discharges. The largest source of ammonium to the system is the Sacramento Regional Wastewater Treatment Plant (Jassby 2008). There is no evidence yet of direct effects on delta smelt, but there are concerns about food web effects based on the finding that phytoplankton growth may at times be inhibited by high ammonium concentrations in the Delta and Suisun Bay (Wilkerson et al. 2006, Dugdale and others 2007; Glibert 2010; Glibert and others 2011). This could directly reduce

primary productivity and alter phytoplankton species composition, which may in turn affect the zooplankton community that delta smelt rely upon (Glibert and others 2011).

Another emerging and related concern for delta smelt is that there are periodic blooms of the toxic blue-green alga *Microcystis aeruginosa* during late summer, most commonly August and September (Lehman and others 2005). These blooms typically occur in the San Joaquin River away from the core summer distribution of delta smelt (Figure 3), but some overlap is apparent. Results by Lehman and others (2010a) indicate a strong likelihood that delta smelt are exposed to microcystins, which may in turn affect their habitat use (Baxter and others 2010). Laboratory studies demonstrate that the blue-green alga is toxic to another native fish of the region, Sacramento splittail *Pogonichthys macrolepidotus* (Acuna and others 2012). Indirect effects are also a major concern as *Microcystis* blooms are toxic to the primary food resources of delta smelt (Ger and others 2009; 2010a; 2010b).

Pesticide effects are less well understood, although effects may be substantial given that agricultural, commercial, and urban purchases of pesticides within the Delta and the upstream watershed averaged 21 million kg annually from 1990 to 2007 (Brooks and others 2011). Intermittent toxicity has been reported for *Ceriodaphnia dubia* an invertebrate surrogate for Delta prey species (Werner and others 2000) and *Hyaella azteca*, a common invertebrate bioassay species (Weston and Lydy 2010; Werner and others 2010).

#### **Geographical Range of Habitat**

A common misconception is that the habitat of delta smelt only occurs in the Delta. The monitoring data indicate that center of distribution for the population commonly occurs in the Delta during spring (Dege and Brown 2004) and fall (Sommer and others 2011a). However, the overall distribution of delta smelt habitat is much broader. To illustrate this point, we summarized survey data for different seasons and water year types by life stage (Figure 3). The survey data show that delta smelt habitat is often located well downstream of the Delta, commonly in Suisun Bay. Their habitat also varies substantially by life stage and water year. The habitat tends to be most landward (upstream) for adults (SKT survey) and most seaward for the other life stages (20 mm, TNS, FMWT). As expected based on their strong association with salinity (Dege and Brown 2004; Sommer and others 2011a), the habitat for younger life stages shifts landward in drier years (Figure 3).

Following the listing of delta smelt in the early 1990s, one of the most surprising initial discoveries was the presence of delta smelt in the Napa River, a tributary to San Pablo Bay (Figure 1). While they are generally caught in wet years (Figure 3), the fact that delta smelt can periodically use this downstream habitat is significant. Hobbs et al. (2007) found that use of habitat in this region results in a unique chemical signature in the otoliths of delta smelt and revealed that the portion of fish that use Napa River can be substantial (e.g. 16–18% of population in 1999).

Another key finding was that delta smelt heavily use the Cache Slough Complex (Sommer and others 2011a). As reported in Sommer and others (2011a), at least some delta smelt occur year-round in the region. Although it is unclear what percentage of the population occurs in this region, survey data suggests that this area sometimes seasonally

supports the majority of the delta smelt catch. To illustrate the importance of the Cache Slough Complex, FWS beach seine surveys during 2002-2004 show that delta smelt apparently occur year-round in Liberty Island (Figure 5) and were present in all stations sampled (Figure 2). Similarly, expanded efforts of the 20-mm, TNS and FMWT surveys into the Sacramento Deepwater Ship Channel found delta smelt June through October, the warmest months of the year (Baxter and others 2010). Delta smelt use of the Cache Slough complex appears to be substantial as the frequency of occurrence in Liberty Island habitats was comparable to FWS beach seine stations located in their core Delta habitat during 2002-2004 (Figure 6). These findings were relatively unexpected as the general assumption at the time was that delta smelt leave the north Delta after larval stage (Sommer and others 2011a). Moreover, flooded islands were generally considered poor-quality habitat for delta smelt in other parts of the Delta (e.g. Grimaldo and others 2004; Nobriga and others 2005).

Although the Napa River and Cache Slough Complex studies provide some cause for optimism with regard to the status and extent of delta smelt habitat, it is important to note one of the most troubling changes over the past four decades, the loss of the south Delta as year-round habitat for delta smelt. As noted by several studies (Nobriga and other 2008; Sommer and others 2011a), the historical data show that many delta smelt remained in the south Delta throughout the summer. While delta smelt still seasonally occur in the south Delta during winter and spring (Figure 3; Sommer and others 2011a), they are now absent in summer. Nobriga and others (2008) suggest that this is due to major habitat changes including the proliferation of aquatic weeds and associated declines in turbidity.

## **Habitat Types**

The general habitat use by delta smelt is basically a function of the features described in the previous sections. Table 3 provides a synthesis of some of the major types based on some fairly broad habitat classifications. The summary is not intended to reflect the temporal and spatial variability in delta smelt distributions within a given habitat; rather it is designed to demonstrate relative patterns among habitat types. Note also that historical collections of delta smelt in any one of these types does not guarantee that future habitat projects will support this species. Any one of a number of physical (e.g. turbidity; temperature), chemical (e.g. contaminants), and biological factors (e.g. food, competitors, predators) may limit the ability of delta smelt to colonize new areas.

## **The Future of Delta Smelt Habitat**

There is widespread consensus among scientists that the upper San Francisco estuary will be quite different in the future (Knowles 2010; Cloern and others 2011). Studies by Mount and Twiss (2005) predict that there is a high probability of massive levee failure in the foreseeable future. This will radically change the salinity distribution along with the types and locations of different habitats (Lund and others 2007; Moyle 2008). As a consequence, it is especially challenging to use observations on current delta smelt habitat to predict future changes. There have at least been efforts to model habitat based on future flow conditions through the present landscape. The results are fairly discouraging, with predictions of reduced area of low salinity habitat as soon as 50 years in the future (Feyrer and others 2011). Even more disturbing is the finding that within

100 years the number of lethal temperature days for delta smelt will greatly increase and that turbidities will decrease (Wagner and others 2011; Cloern and others 2011). At the same time major biological community changes are inevitable, along with very different physical and chemical regimes (Lund and others 2007; Cloern and others 2011). These issues raise the question of whether delta smelt will be able to persist with climate change. At the very least, the analyses help show that current habitat conditions are not sustainable (Lund and others 2007), making it critical to begin planning for ways to react to long term changes.

### **Management Implications**

The available information suggests a high degree of uncertainty about many aspects of delta smelt habitat (e.g. Brown 2003). This is to be expected given the relatively rare status of this species and the difficulty in directly measuring habitat use in a highly variable and turbid environment. This does not mean, however, that there is insufficient information to examine some of the management issues with delta smelt habitat. Some basic ideas are provided below. Note that we do not specifically address the issue of how much habitat would be required to generate a measurable increase in the population of delta smelt. Such analyses are notoriously difficult and uncertain, even for better-studied fishes such as salmonids (Roni and others 2010). A major part of the problem is that habitat often is not the only factor controlling fish abundance, likely the case for delta smelt (Sommer and others 2007; MacNally and others 2008; Baxter and others 2010).

639

640 *We know enough to attempt some large scale habitat projects.*

641

642         While there is not sufficient information to fully design delta smelt habitat,  
643 enough is known to attempt major projects to evaluate some of the key questions. For  
644 example, the salinity, turbidity, temperature, and food requirements provide a basic  
645 description of some of the most important habitat features. Moreover, the large  
646 unintentional flooding of Liberty Island and subsequent colonization by delta smelt  
647 suggests that there is some potential to expand and improve the habitat of this imperiled  
648 species. Indeed, the status of delta smelt is so dire, that we cannot simply hope that the  
649 species will be able to recover without several different types of active management.  
650 It therefore seems prudent to proceed with one or more large scale projects provided that  
651 there is an intensive field monitoring and adaptive management process.

652         Since much of the proposed habitat restoration activities will likely occur in  
653 Suisun Marsh and the north Delta, we propose that new habitat projects try and emulate  
654 key aspects of these regions. Based on our analyses, some general suggestions are  
655 provided in Table 4. Note that these habitat features are not intended as the sole design  
656 criteria for this species. A given project will fail if the constructed habitat if it is subject  
657 to periodic water quality issues such as low dissolved oxygen, pesticides, and toxic algal  
658 blooms, or high levels of predators or invasive species. In general, maintaining high  
659 levels of variability and complexity has been suggested as a key approach to promote  
660 native fishes (Moyle and others 2010).

661



662 ***Habitat restoration is highly vulnerable to several factors.***

663  
664 The vulnerability of habitat restoration to future climate change was discussed  
665 above. However, even under limited climate change there are many factors than can  
666 undermine the value of habitat for delta smelt. Of primary concern is the effect of alien  
667 species, given the high level of invasions in the estuary (Cohen and Carlton 1998).  
668 Submerged aquatic vegetation such as Egeria can quickly colonize shallow areas of the  
669 Delta (Brown and Michniuk 2007), covering shallow open water areas that provide part  
670 of the habitat for delta smelt. A notable local example is Decker Island, where a  
671 restoration project was constructed next to a known “hot spot” for delta smelt, yet the  
672 small dendritic channels were rapidly choked with Egeria. SAV is especially attractive to  
673 invasive predators (Grimaldo and others 2004; Brown and Michniuk 2007), that create  
674 mortality risks for delta smelt. However, SAV is not necessary for predator colonization  
675 as recently-created open water areas such as Liberty Island now support large numbers of  
676 striped bass and inland silverside. In addition, it is possible that new habitat projects may  
677 be subject to harmful algal blooms or localized runoff problems. The bottom line is that  
678 delta smelt habitat restoration may be hard to achieve since there are many pitfalls.  
679 Careful site selection and design coupled with intensive monitoring will be needed to  
680 minimize these risks.

681  
682 ***Bet hedging is critical***

Our review of the habitat needs of delta smelt reveals substantial uncertainty about specific features that will support this fish. Given the high level of uncertainty, a sensible approach is to adopt a “bet hedging” strategy coupled with intensive monitoring and evaluation. Of particular importance is the development of habitat projects in more than one geographic area that include multiple habitat types. This is critical given the projection for future climate change (Wagner and others 2011; Cloern and others 2011), the vulnerability of the Delta to floods and earthquakes (Mount and Twiss 2005; Moyle 2008), and the apparent diversity of delta smelt life histories. An emerging story is that the delta smelt do not undergo uniform upstream migration of adults followed by downstream migration of juveniles into the low salinity zone (Sommer and others 2011a). The year-round presence of delta smelt in the north Delta region is evidence of divergent migration pathways (Sommer and others 2011a). Indeed, new otolith research by Hobbs (2010) suggests that the range of life histories includes freshwater spawning/freshwater rearing, freshwater spawning/brackish rearing, brackish spawning/brackish rearing with multiple variations in the specific timing. Again, this means that a single habitat type or region should not be the focus of habitat restoration for delta smelt.

*Processes may be more important than specific habitat features*

Habitat restoration projects typically try and maximize the specific features that the target species prefers. Obviously, this is a key first step as fishes like delta smelt cannot colonize a habitat unless its basic environmental needs are met. Unfortunately, this can result in over-engineering of habitats, something that may not be justified given

the high level of uncertainty about delta smelt habitat and the future of the delta. We propose that an increased emphasis on processes may be more successful than the construction of well-engineered “gardens”. Key processes include sustainability and food web subsidies across habitats.

With regard to sustainability, habitats need to be designed to accommodate anticipated changes that will occur over the next century and beyond. Key changes include a declining sediment load (Wright and Schoellhamer 2004) that will strongly affect accretion and degradation rates of delta habitats, and sea level rise which is expected to eventually submerge many lower elevation sites. Careful selection of sites to progressively accommodate sea level rise is therefore a high priority. The declining sediment load is more problematic, but locating restoration areas in sites with relatively higher sedimentation or re-suspension rates may help to alleviate problems.

Although most of the carbon inputs to the food web appear to be from riverine inputs (Jassby and Cloern 2000; Kimmerer 2004), there is a growing ecological recognition that there may be substantial localized inputs across adjacent habitats. This is certainly the case with Yolo Bypass, which exports primary and secondary production to downstream areas (Schemel and others 2004; Sommer and others 2004b). Liberty Island may also export production during some seasons (Lehman and others 2010b). However, some areas such as SAV habitat in other parts of the Delta show evidence of being trophically decoupled from offshore food webs (Grimaldo and others 2009b), so few subsidies are expected across these habitats. The degree to which tidal marsh habitat may subsidize adjacent pelagic habitat remains unclear (Brown 2003), but there is some evidence that marsh exports could be important. In general, phytoplankton and

zooplankton levels are higher in small channels surrounded by dense emergent vegetation in Suisun Marsh (Rob Schroeter, UC Davis, unpublished data). This may be more a function of longer residence time in these low order channels, but marsh subsidies are also likely. In any case, it seems wise to consider habitat projects in locations where trophic subsidies are most likely (Jassby and Cloern 2000).

*Several key studies are needed*

As suggested previously, delta smelt habitat restoration will not succeed unless there is a sufficiently high level of monitoring and research. Moreover, these types of studies are needed immediately in order to learn from existing habitat use by delta smelt, and to develop baseline data and methodologies to evaluate project success. With respect to habitat use, we have learned quite a bit about the basic needs of delta smelt from long-term monitoring and laboratory studies, but we expect that much more information would be gained from efforts designed specifically to assess habitat use. Specifically, stratified randomized sampling methods are a more statistically defensible way to assess habitat use than fixed stations and can be customized to evaluate habitat types and features not covered by the existing monitoring network. Such surveys would be a useful supplement to the existing long term monitoring conducted in the estuary. Initial efforts should be focused on locations such as Suisun Marsh and the Cache Slough Complex, the two major target areas for restoration and existing “hot spots” for delta smelt.

An ongoing issue for the study of delta smelt habitat has been that this listed species is rare and fragile, so “take” is generally a concern. This means that we are

unlikely to be able to greatly increase our sampling efforts in areas where delta smelt are common. A major priority is therefore the development of improved telemetry, marking and imaging techniques to minimize take of delta smelt. In the short term, perhaps the most promising method is the use of underwater cameras. There are currently studies investigating the use of a towed net fitted with a camera at its (open) cod end (Baxter and others 2010). The camera and associated image processing software were successfully used in fall 2011 to identify and record delta smelt in several locations of the low salinity zone. Such methods may allow much more intensive sampling of different habitats without incurring high mortality. Better use of samples from the existing monitoring program using novel approaches such as otolith microchemistry may provide additional insight into delta smelt habitat use and migration patterns (Hobbs and others 2007; Hobbs 2010).

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1159 Society (B) 73(1):3-36  
1160

1161 Table 1: Generalized additive modeling (GAM) delta smelt results for the 20 mm survey  
 1162 including Temperature (T), Specific Conductivity (C), Secchi depth (S), and Calanoid  
 1163 Copepod Density (F). The variances in each model were all statistically significant  
 1164 ( $P < 0.00001$ ) based on approximate Chi square tests.

1165

Model	Residual Deviance (Percentage of total explained in parentheses)
T	5158 (7.1)
T + C	4876 (12.2)
T + C + S	4640 (16.4)
T + C + S + F	4514 (18.7)

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1168



1169 Table 2: Substrate use by delta smelt as sampled by six core USFWS beach seine  
 1170 stations in the west Delta since 1993 (see text for details). The Chi-square analysis  
 1171 excluded vegetated substrate because it included no catch, which violates the assumption  
 1172 of that test.

1173

Substrate	Samples with delta smelt	Total samples (effort)
Gravel	6	338
Mud	39	2483
Pavement	6	2508
Sand	116	6945
Vegetation	0	183

1174 Chi square = 29.15, DF = 3,  $p < 0.001$  (Excluding vegetation)

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1177

1178 Table 3: Habitat types in which delta smelt have been collected: \*= rare; \*\*=periodic,

1179 \*\*\* = common. As noted in the text, historical observations do not ensure that newly

1180 created habitats will support delta smelt.

Region	Habitat	Present	Comments	Sources
<b>Marine</b>  Examples: Lower Napa River, San Pablo Bay	-Bay  -Channel  -Marsh	*  *  **	Generally only during high flow events.  Collections adjacent to Napa marshes.	Bennett (2005); Hobbs and others (2007); DFG Bay Study & Townet Survey.
<b>Brackish</b>  Examples: Suisun Bay, West Delta	-Bay  -Channel  -Marsh	***  ***  **	Core habitat.  Core habitat.  Collections adjacent to Suisun Marsh.	Moyle and others (1992); Aasen (1999); Bennett (2005); Feyrer and others (2007); Dege and Brown (2004); Sommer and others (2011a); UCD Suisun Marsh Survey (unpubl).
<b>Freshwater</b>  Examples: Sacramento River, Cache Slough, Sacramento Deep Water Ship Channel.	-Non-tidal  -Tidal channel  -Littoral  -Emergent marsh.  -SAV	*  ***  ***  ?  *	Rare, highly seasonal.  Primarily North Delta.  Primarily North Delta.  Little sampling.  Collections adjacent to SAV.	Aasen (1999)  Grimaldo and others (2004); Nobriga and others (2005); Sommer and others (2011a); DFG Fall Midwater and Kodiak Trawls; FWS Juvenile Salmon & Liberty Surveys (unpubl); This Report.

1181

1182 Table 4: Suggested habitat features for pilot delta smelt restoration projects. See text for  
 1183 details.  
 1184

Habitat Feature	Comments	Citations
<i>Low salinities</i> <ul style="list-style-type: none"> <li>Typically &lt;6 psu</li> </ul>	The best-studied variable that defines the habitat of delta smelt.	Bennett (2005) Feyrer and others (2007) Kimmerer and others (2009)
<i>Moderate temperatures</i> <ul style="list-style-type: none"> <li>7-25° C</li> </ul>	The upper temperature limits appear consistent for laboratory and field studies, but tolerance is strongly affected by food availability and acclimation conditions. Lower limits have not been studied in detail, but stress from very low temperatures is likely.	Swanson and others (2000) Bennett (2005) Nobriga and others (2008) Bennett and Burau (2010)
<i>High turbidity</i> <ul style="list-style-type: none"> <li>&gt;12 ntu</li> </ul>	Regions with shoal habitat and high wind re-suspension may help maintain high turbidities.	Feyrer and others (2007) Grimaldo and others (2009a)
<i>Sand-dominated substrate</i>	May be useful as spawning substrate.	This report.
<i>At least moderately tidal</i>	Delta smelt are only rarely observed outside tidal areas.	This report.
<i>High copepod densities</i>	Delta smelt survival appears to be linked to higher levels of calanoid	Nobriga (2002)

	copepods in the low salinity zone.	Moyle (2002)  Kimmerer (2008b)
<i>Low SAV</i>	The absence of delta smelt in most SAV sampling indicates that submerged vegetation degrades habitat value.	This report.  Grimaldo and others (2004)  Nobriga and others (2005)
<i>Low Microcystis</i>	The absence of delta smelt in areas with periodic Microcystis levels indicates that these blooms degrade habitat values.	Baxter and others (2010)  Lehman and others (2010)  This report.
<i>Open water habitat adjacent to long residence time habitat (e.g. low order channels; tidal marsh).</i>	This concept has not been tested statistically, but the frequent occurrence of delta smelt in these habitats suggests that it may be important.	Aasen (1999)  This report.

1185

## Figure Legends

Figure 1. The San Francisco estuary including key landmarks noted in the text. The Delta is the area between Chipps Island, Sacramento, and just south of Stockton.

Figure 2. Locations of USFWS beach seine sampling in Liberty Island. The stations starting counter clockwise from the southeast corner of the site are: Liberty Island East #1-5 and Liberty Island #1-5. The data show the percentage of samples with delta smelt in different parts of Liberty Island based on data from August 2002- October 2004 (n = 607 hauls).

Figure 3. Summary of the extent of delta smelt habitat for four surveys: FMWT, SKT, 20 mm, and TNS. The data are for 2002-2010, when all surveys were conducted. The lines show the upstream and downstream limits of catch for wet (left panel) and dry (right panel) years based on the distance from the Golden Gate Bridge. The circles represent the center of distribution for each survey (see text and Sommer and others 2011a). Note that the surveys do not include inshore habitat or locations around the periphery of the estuary (e.g. Liberty Island, upper Deep Water Ship Channel).

Figure 4. Generalized additive (GAM) model predictions of delta smelt occurrence in the 20 mm survey (based on all four habitat variables) verses the habitat variables for: a) water temperature; b) specific conductivity; c) Secchi depth; and d) calanoid copepod density.

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1210 Figure 5. Distribution of catch of delta smelt across seasons in Liberty Island based on

1211 USFWS beach seine data from August 2002- October 2004 (n = 93 fish).

1212

1213 Figure 6. Percentage of beach seine samples with delta smelt in different parts of Liberty

1214 Island (ten “LI” stations) as compared to five core west and north Delta sites. Analyses

1215 are based on USFWS beach seine sampling in these locations during August 2002-

1216 October 2004. The locations of the Liberty Island stations are shown in Figure 2. The

1217 differences between the Liberty Island and core Delta stations were not significantly

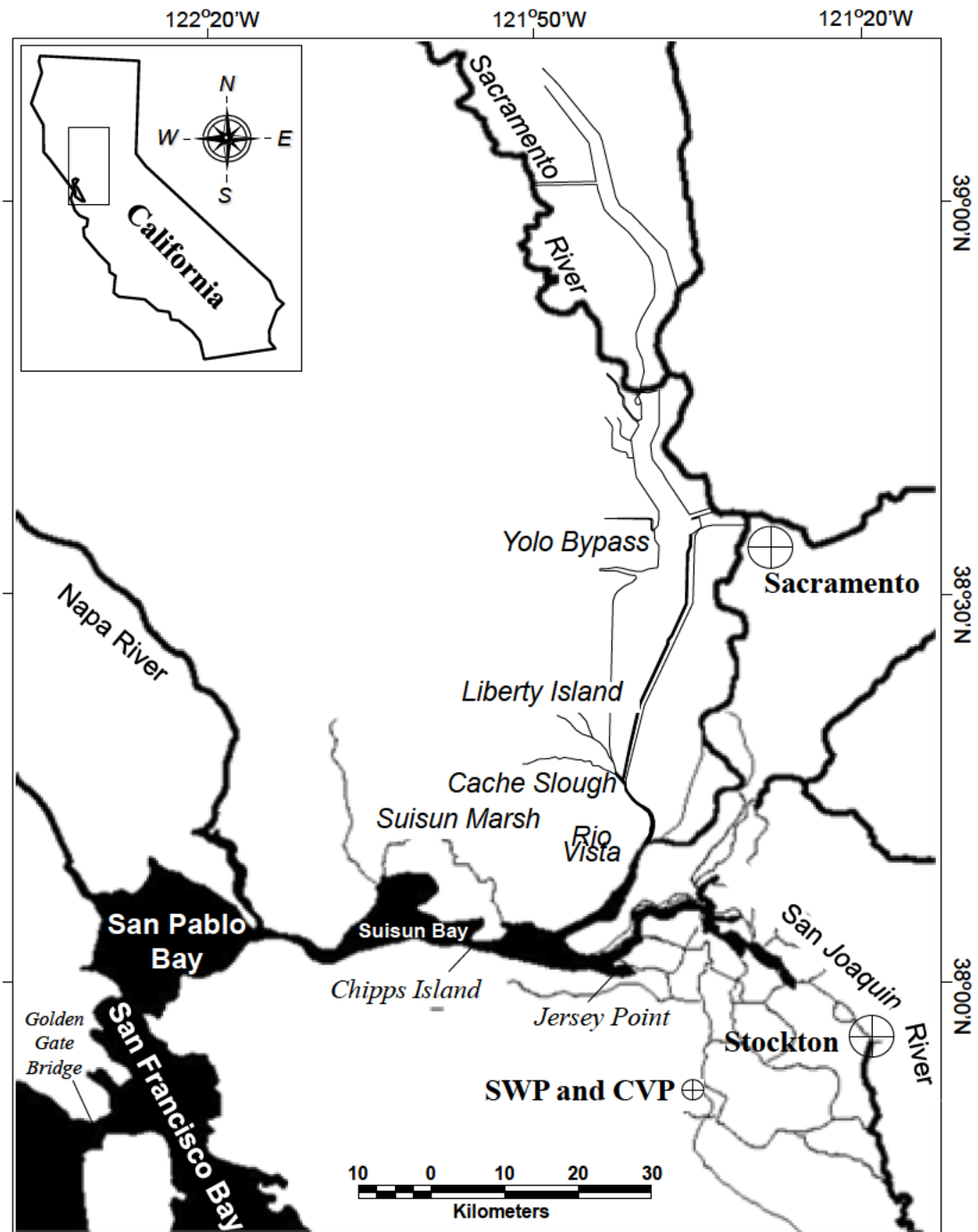
1218 different based on a Kruskal-Wallis test ( $p=0.065$ ).

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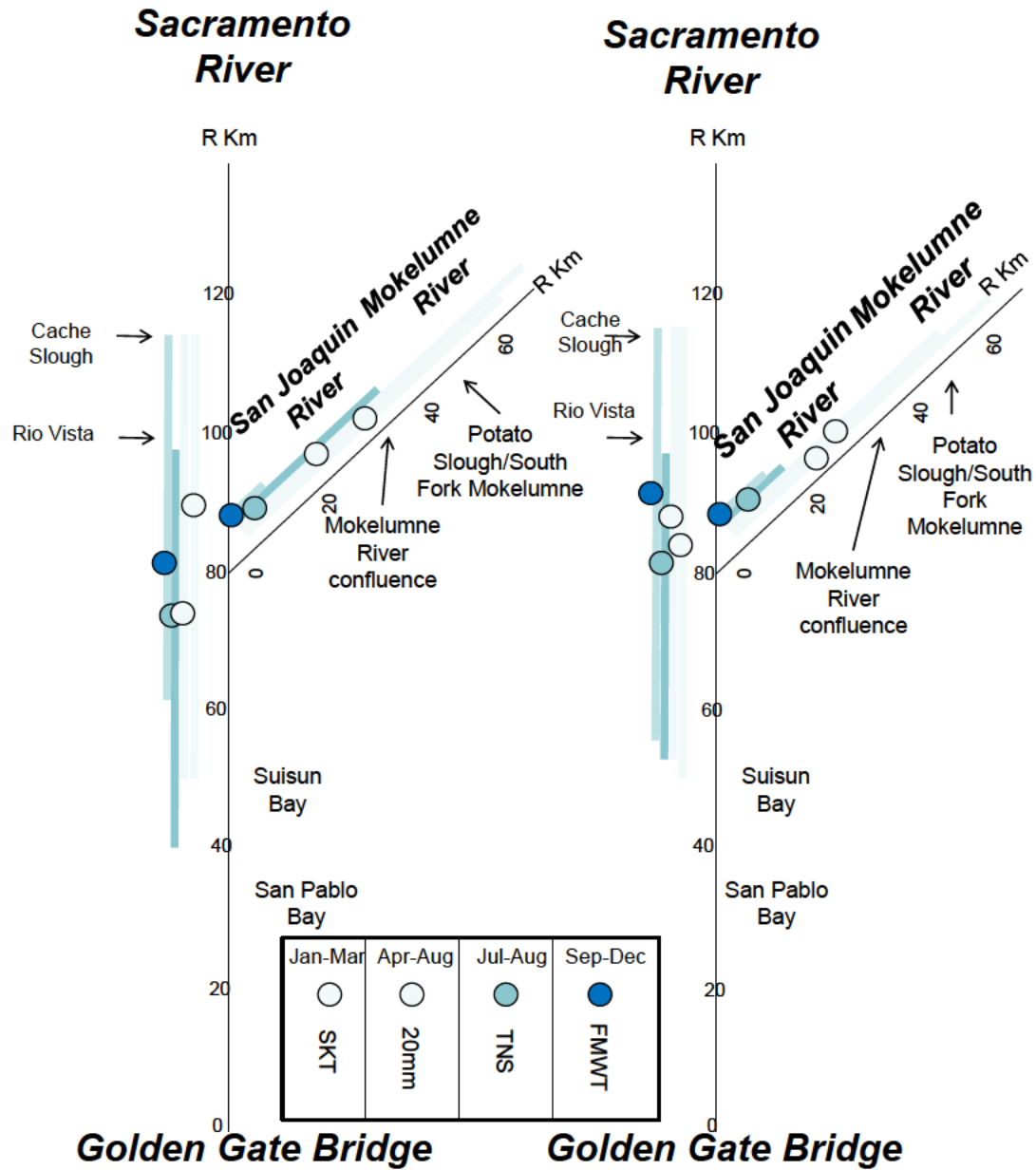


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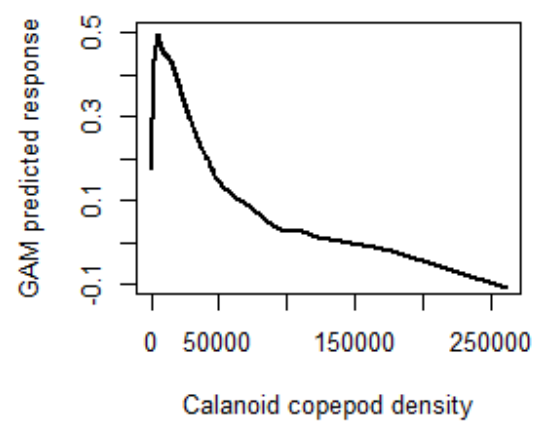
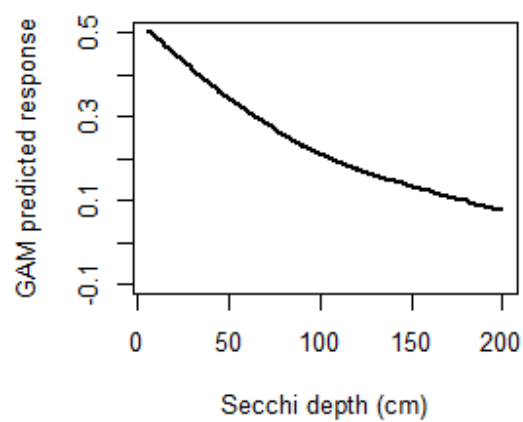
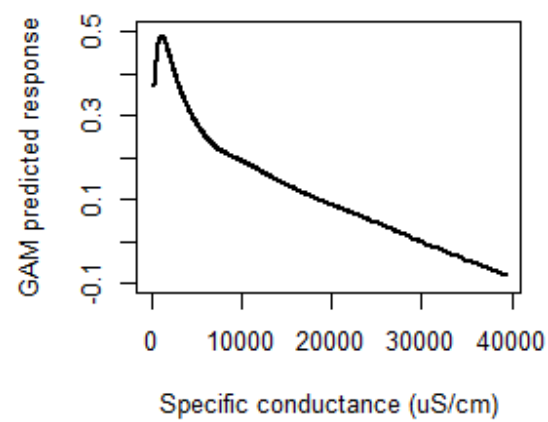
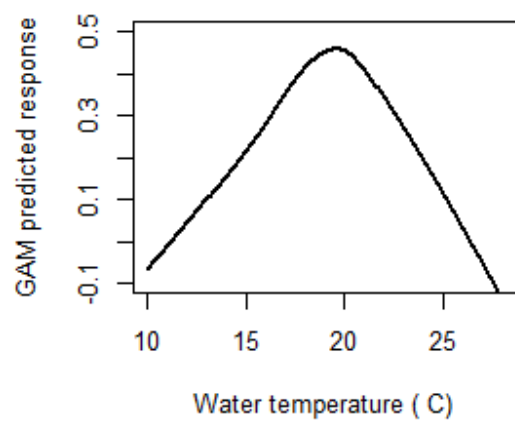
## WET YEARS

## DRY YEARS



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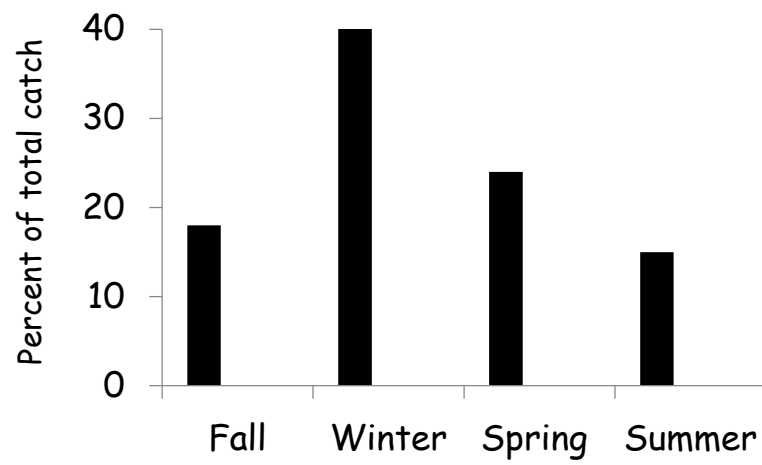
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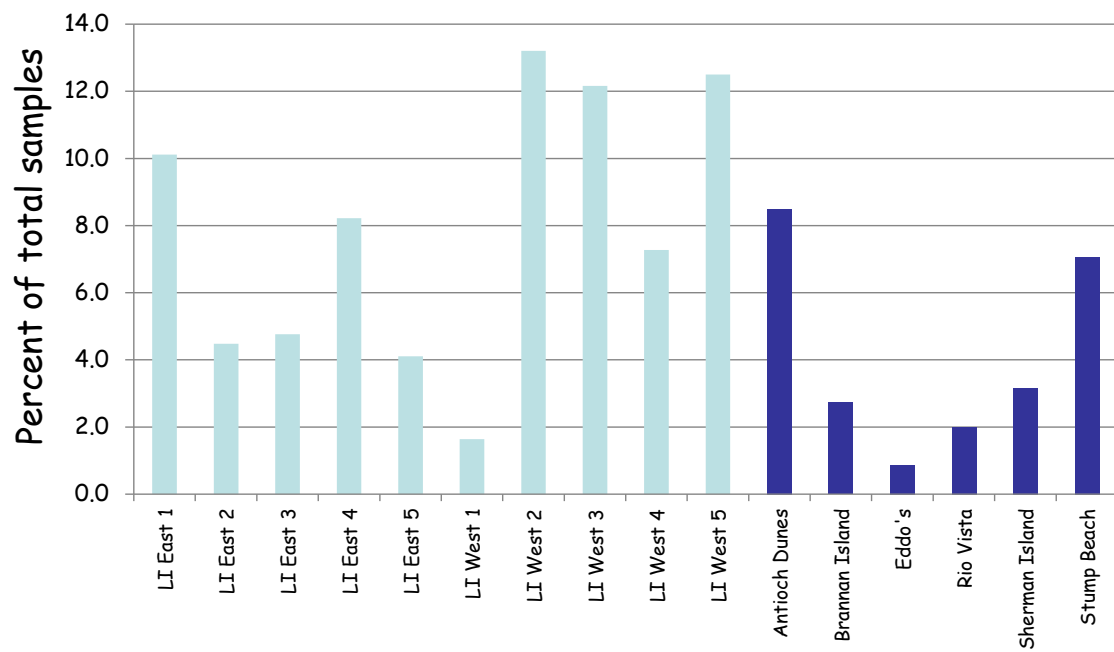


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Dennis Murphy's additional concerns are noted below in red. Lloyd

There are more issues. Especially two overarching ones. First, is the misuse of essential terminology. Plain and simple, from "habitat" to "population," Sommer mischaracterizes the very foci of the so-called study. It is ecologically incompetent on the conceptual and technical fronts.

And, second, more importantly, is the presentation of ostensible facts that are often not so -- oddly parallel to his migration paper — accompanied by conclusion statements that are not linked to those "facts" empirically.

Combined the paper is not an analysis of information but an exercise in unsupported assertion, and its publication becomes the vehicle for institutionalizing the assertions. This piece is not "science" in any interpretation, which is rather a problem to us.

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Lloyd,

Great comments.

An incidental, but important, comment. The agencies typically estimate the center of the distribution as the centroid of DENSITIES! This is incorrect. The centroid of abundance is not the centroid of densities.

Here is an example of why: Suppose that smelt are uniformly distributed over a region, upstream-to-downstream. Now assume that they simply spread out, with an equal number moving upstream as downstream, so the centroid of their distribution does not change. However, the ones that moved upstream are moving into a lower volume, and the ones that move downstream are moving into a larger volume. So, the upstream densities are now higher than the previous upstream densities and the downstream densities are lower than the previous downstream densities. A comparison of the centroid of densities before and after the movement would appear to show that the centroid had moved upstream when, actually, it had not changed at all. Therefore, the centroid of distribution of delta smelt must be estimated as the centroid of abundance (density x volume).

This mis-calculation might be one reason that the agencies think that smelt migrate. If downstream densities decrease, it still might be possible that downstream abundances are large relative to upstream ones because of the larger volume of water in downstream areas.

This has other, related implications. For example, based on densities, Suisun Bay may not be as desirable a place for delta smelt as some upstream areas. But because Suisun Bay is so large, a majority of the smelt could still be there. Put another way, a large volume with marginal or poor habitat attributes might contain more smelt than a smaller volume with good habitat attributes.

BJ

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Regards,

Ted Sommer, PhD  
Program Manager II  
California Department of Water Resources  
3500 Industrial Blvd  
West Sacramento CA 95691-6521  
Mailing Address: PO Box 942836  
Sacramento CA 94236-0001  
Tel: 916-376-9772

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**CC:** Valerie Connor; Simonek, Laura J; Jerry Johns; Jason Peltier; Becky Sheehan; Brenda Burman; David Fullerton; Dennis Murphy; Frances Brewster; Lauren Bauer (lbauer@kcwa.com); Lynda Smith; M Ward; Rick Sitts; Sheila Greene; Tom Mongan; Byron Buck; Hamilton, Scott

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Another statement of beliefs presented as science.

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**Sent:** Wednesday, May 23, 2012 7:52 PM  
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Lloyd,

Great comments.

An incidental, but important, comment. The agencies typically estimate the center of the distribution as the centroid of DENSITIES! This is incorrect. The centroid of abundance is not the centroid of densities.

Here is an example of why: Suppose that smelt are uniformly distributed over a region, upstream-to-downstream. Now assume that they simply spread out, with an equal number moving upstream as downstream, so the centroid of their distribution does not change. However, the ones that moved upstream are moving into a lower volume, and the ones that move downstream are moving into a larger volume. So, the upstream densities are now higher than the previous upstream densities and the downstream densities are lower than the previous downstream densities. A comparison of the centroid of densities before and after the movement would appear to show that the centroid had moved upstream when, actually, it had not changed at all. Therefore, the centroid of distribution of delta smelt must be estimated as the centroid of abundance (density x volume).

This mis-calculation might be one reason that the agencies think that smelt migrate. If downstream densities decrease, it still might be possible that downstream abundances are large relative to upstream ones because of the larger volume of water in downstream areas.

This has other, related implications. For example, based on densities, Suisun Bay may not be as desirable a place for delta smelt as some upstream areas. But because Suisun Bay is so large, a majority of the smelt could still be there. Put another way, a large volume with marginal or poor habitat attributes might contain more smelt than a smaller volume with good habitat attributes.

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Val, correct me if I'm wrong, but the Sommer et al. paper has only been submitted, not yet reviewed and accepted. I think Val said in her email that she is going to ask Luoma if she can be one of the formal reviewers. This is a far better option than a rebuttal paper after the fact.

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**To:** King Moon, Laura; [rpatterson@mwdh2o.com](mailto:rpatterson@mwdh2o.com); [jpeltier@westlandswater.org](mailto:jpeltier@westlandswater.org)  
**Cc:** Karla Nemeth; Carl Wilcox  
**Subject:** FW: Delta Smelt Habitat Paper Submitted

I think this will help with our habitat efforts.

Jerry

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**From:** Sommer, Ted [<mailto:tsommer@water.ca.gov>]  
**Sent:** Monday, May 21, 2012 10:23 AM  
**To:** Jerry Meral  
**Cc:** Messer, Dean F.; Spaar, Stephani; McEwan, Dennis  
**Subject:** Delta Smelt Habitat Paper Submitted

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Note that I had already provided copies of the last draft to the BDCP consultants, who incorporated some of the information into their analyses.

Don't hesitate to let me know if you have any questions.

Regards,

Ted Sommer, PhD  
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3500 Industrial Blvd  
West Sacramento CA 95691-6521  
Mailing Address: PO Box 942836  
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Tel: 916-376-9772

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Lloyd channeling Valerie here.

Correct, Frances. It has only been submitted at this point.

Valerie articulated an alternative to me today involving having a conversation with Peter Goodwin and Sam Luoma (if he is available – he is living in South Africa now). The conversation would mention the Sommer et al. (2011) migration paper, the Sommer and Mejia submittal on delta smelt habitat, the Merz et al. (2012) paper on delta smelt distribution, and the Hamilton and Murphy (submitted or in prep, I'm not positive) paper on delta smelt habitat characteristics. In the interest in balance (which the online journal touts as one of its strong points) we would push them to publish a version of Hamilton and Murphy. If people then want to submit additional discussion pieces (as with Miller 2011 and Kimmerer 2011) then great – we have our forum to publish. If they decline to publish Hamilton and Murphy, it can be submitted to a conservation journal for publishing. Another alternative is to wait until Sommer and Mejia (submitted) is published in the online journal (does anybody doubt that it will?) and then prepare a rebuttal. This alternative would be made stronger if Valerie was one of the reviewers and it still ended up being published without addressing our legitimate concerns.

Lloyd

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**Sent:** Thursday, May 24, 2012 5:11 PM  
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**Sent:** Thursday, May 24, 2012 2:56 PM

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**Cc:** Byron Buck; Hamilton, Scott

**Subject:** RE: Delta Smelt Habitat Paper Submitted

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**Cc:** [jpeltier@westlandswater.org](mailto:jpeltier@westlandswater.org)

**Subject:** FW: Delta Smelt Habitat Paper Submitted

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**To:** King Moon, Laura; [rpatterson@mwdh2o.com](mailto:rpatterson@mwdh2o.com); [jpeltier@westlandswater.org](mailto:jpeltier@westlandswater.org)

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**To:** Jerry Meral

**Cc:** Messer, Dean F.; Spaar, Stephani; McEwan, Dennis

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Note that I had already provided copies of the last draft to the BDCP consultants, who incorporated some of the information into their analyses.

Don't hesitate to let me know if you have any questions.

Regards,

Ted Sommer, PhD

Program Manager II

California Department of Water Resources

3500 Industrial Blvd

West Sacramento CA 95691-6521

Mailing Address: PO Box 942836

Sacramento CA 94236-0001

Tel: [916-376-9772](tel:916-376-9772)

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**To:** Jerry Johns; Frances Brewster  
**CC:** Jason Peltier; Sheila Greene; Lynda Smith; Hamilton, Scott; Rick Sitts; Valerie Connor; M Ward; David Fullterton; Becky Sheehan; Byron Buck; Simonek,Laura J; BJ Miller; Tom Mongan; Lauren Bauer (lbauer@kcwa.com); Dennis Murphy; Brenda Burman  
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Jerry, I forgot about that process! The paper does, indeed, indicate that Ted and Francine work for DWR. That might be an elegant solution, but we may need someone other than Valerie to be the bad cop here.

If the paper has already been submitted, then what is the likelihood that Dean would direct Ted and Francine to withdraw it in order to address our concerns?

Lloyd

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Another statement of beliefs presented as science.

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916.719.9408

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**To:** T Birmingham; Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Burman, Brenda W; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; [frances.mizuno@sldmwa.org](mailto:frances.mizuno@sldmwa.org); Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear, Adam C; Laura King Moon; Simonek, Laura J; Lloyd Fryer; 'Martin McIntyre'; Mike Henry; Mike Wade; Neudeck, Randall D; Philp, Thomas S; Rodriguez, Larry; Patterson, Roger K; Rose Schlueter; Sheila Greene; Arakawa, Stephen N; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'  
**Subject:** FW: Delta Smelt Habitat Paper Submitted

---

**From:** Jerry Meral [<mailto:jerry.meral@resources.ca.gov>]  
**Sent:** Wednesday, May 23, 2012 7:52 PM  
**To:** King Moon, Laura; [rpatterson@mwdh2o.com](mailto:rpatterson@mwdh2o.com); [jpeltier@westlandswater.org](mailto:jpeltier@westlandswater.org)  
**Cc:** Karla Nemeth; Carl Wilcox  
**Subject:** FW: Delta Smelt Habitat Paper Submitted

I think this will help with our habitat efforts.

Jerry

---

**From:** Sommer, Ted [<mailto:tsommer@water.ca.gov>]  
**Sent:** Monday, May 21, 2012 10:23 AM  
**To:** Jerry Meral  
**Cc:** Messer, Dean F.; Spaar, Stephani; McEwan, Dennis  
**Subject:** Delta Smelt Habitat Paper Submitted

Jerry,

Thanks for your patience on the delta smelt habitat white paper. I wanted to let you know that I submitted the attached paper today to the journal San Francisco Estuary and Watershed Science. I was able to take advantage of quiet BDCP week (i.e. no long reviews), plus I finally got the material I needed from my co-author, who left DWR this fall to go back to grad school.

Note that I had already provided copies of the last draft to the BDCP consultants, who incorporated some of the information into their analyses.

Don't hesitate to let me know if you have any questions.

Regards,

Ted Sommer, PhD

Program Manager II

California Department of Water Resources

3500 Industrial Blvd

West Sacramento CA 95691-6521

Mailing Address: PO Box 942836

Sacramento CA 94236-0001

Tel: [916-376-9772](tel:916-376-9772)

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**From:** Jason Peltier  
**Sent:** Sunday, May 27, 2012 8:55 AM  
**To:** T Birmingham; Joe Findaro; David Bernhardt; Tony Coelho  
**Subject:** Grace

## Napolitano, Gonzalez and Miller vying in new 32nd Congressional District

By Steve Scauzillo, SGVN  
[twitter.com/stevscaz](https://twitter.com/stevscaz)sgvtribune.com  
Posted: 05/26/2012 07:11:13 AM PDT

When the redistricting commission finished drawing the new 32nd Congressional District, it appeared as if it was drawn for a Latino and a Democrat.

It is one of two local Latino districts created by the commission and includes the Latino majority communities of Baldwin Park, El Monte, Azusa, Valinda, La Puente and Irwindale, as well as West Covina, La Verne and Covina. Voters registered as Democrats represent 47 percent of the electorate, as compared to 27 percent registered Republicans and 20 percent who decline to state a party affiliation.

That is why nine-year Rep. Grace Napolitano, a Democrat from the Norwalk-Pico Rivera area, and a Latina, felt at home picking the central San Gabriel Valley District to try for her 10th term, though many of the cities are new to her, according to analysts.

Napolitano has been representing the overlapping 38th Congressional District. While the newly drawn 32nd district shares some of the same cities with Napolitano's current district - including La Puente and parts of Industry - much of the district is new.

Still, despite facing Republican and Democratic challengers in the June 5 primary, the district's demographics will make victory come easily, predicted Allan Hoffenblum, a former GOP consultant and author of the California Target Book, which analyzes races across the state for potential winners and losers.

"Grace Napolitano will now be the Latino representative of the San Gabriel Valley,"

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Advertisement

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Hoffenblum said.

But there is another Latino running against her: Bill Gonzalez, 51, who emigrated from Guadalajara, Mexico with his parents when he was a child and grew up in Covina and El Monte. He's also a Democrat, having solidified his Democratic credentials by spending 10 years as deputy state director for U.S. Sen. Dianne Feinstein, D-Calif. He now works as director of governmental relations for the MediCal Managed Care Commission.

Two Democrats who are both Latino running in a heavily Democratic/Latino voter district - that formula could mean Napolitano and Gonzalez will finish first and second in the June 5 primary, leaving them to face each other in the November general election.

This unique scenario is what political pundits say could be the most dramatic result of the open primary system - approved by voters in 2010 - whereby voters of any party or no party can vote for any candidate. The top two vote-getters move on to November.

"The top-two primary is designed to impact those districts that are fairly safe," explained Dan Schnur, executive director of the Jesse M. Unruh Institute for Politics at USC.

In short, Schnur says if the district favors one party over another, as does the 32nd, things could get a lot tighter in November.

"They present the opportunity for a competitive election in the fall," he said. "This will force the candidates to spend more time campaigning... not just within their own party, but to spend time with independent voters and those in the other party in the general election."

Republican party candidate David Miller, 48, of Glendora, is not waiting until the fall. In fact, Miller, a general contractor, says he's hoping to snag Republican and independent voters in the primary and wind up opposing Napolitano in November.

Miller, who calls himself a constitutionalist, believes that if it is not spelled out in Article I, Section 8 of the Constitution, then Congress shouldn't do it. For example, he's for doing away with the U.S. Department of Education.

"The federal government has a specific role and that is to protect and defend our rights," he said. Miller strongly objects to erosion of rights, specifically mentioning law enforcement overstepping their constitutional authority over searches and seizures.

Miller made an unsuccessful bid against Rep. David Dreier, R-San Dimas, in 2010.

Napolitano has worked extensively on clean water issues, which include trying to provide federal dollars for San Gabriel Valley ground-water cleanup projects. She's also worked to provide mental health services to minorities.

She's now trying to get to know new voters.

"I've gotten to know them. I've worked with the San Gabriel Valley COG (Council of Governments) for the last 10 years," she said. She'd like to work on helping small businesses expand, and providing more funding for school districts.

As of May 16, Napolitano had \$288,307 cash on hand, according to campaign records. Miller said he did not know how much money he had raised. Gonzalez said he had raised about \$5,400 to date.

"I didn't get union endorsements and big corporate endorsements that my opponent Grace Napolitano got," Gonzalez said. "But I have a good sense of the needs of this community."

**From:** Valerie Connor

**Sent:** Tuesday, May 29, 2012 11:24 AM

**To:** Frances Brewster; Jerry Johns

**CC:** Jason Peltier; Sheila Greene; Lynda Smith; Hamilton, Scott; Ifryer@l-squared.com; Rick Sitts; M Ward; David Fullerton; Becky Sheehan; Byron Buck; Simonek, Laura J; BJ Miller; Tom Mongan; Lauren Bauer (lbauer@kcwa.com); Dennis Murphy; 'Burman, Brenda W'

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1121 L St., Suite 806  
Sacramento, CA 95814  
office: (916) 476-5053  
cell: (530) 219-9295

VConnor@sfcwa.org

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**Sent:** Thursday, May 24, 2012 5:28 PM  
**To:** Jerry Johns  
**Cc:** Jason Peltier; Sheila Greene; Lynda Smith; Hamilton, Scott; Ifryer@l-squared.com; Rick Sitts; Valerie Connor; M Ward; David Fullerton; Becky Sheehan; Byron Buck; Simonek,Laura J; BJ Miller; Tom Mongan; Lauren Bauer (lbauer@kcwa.com); Dennis Murphy; 'Burman,Brenda W'  
**Subject:** RE: Delta Smelt Habitat Paper Submitted

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**Subject:** RE: Delta Smelt Habitat Paper Submitted

Another thought. If this paper has not yet been submitted find out if Ted intends to state that he works for DWR. If so, there is a review process within DWR for papers. Get to Dean Messer with your concerns and perhaps you can head this off at the pass or get it modified to address your concerns.

Jerry Johns  
[jjohnswater@gmail.com](mailto:jjohnswater@gmail.com)  
(916) 995-9266

On May 24, 2012 5:10 PM, "Frances Brewster" <[FBrewster@valleywater.org](mailto:FBrewster@valleywater.org)> wrote:

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---

**From:** BJ Miller [mailto:[bjmiller41@gmail.com](mailto:bjmiller41@gmail.com)]  
**Sent:** Thursday, May 24, 2012 5:01 PM  
**To:** [Ifryer@l-squared.com](mailto:Ifryer@l-squared.com)  
**Cc:** Valerie Connor; Simonek,Laura J; Jerry Johns; Jason Peltier; Becky Sheehan; Brenda Burman; David Fullerton; Dennis Murphy; Frances Brewster; Lauren Bauer ([lbauer@kcwa.com](mailto:lbauer@kcwa.com)); Lynda Smith; M Ward; Rick Sitts; Sheila Greene; Tom Mongan; Byron Buck; Hamilton, Scott  
**Subject:** Re: Delta Smelt Habitat Paper Submitted

Another statement of beliefs presented as science.

What do we do about this? I think a letter to Luoma pointing out these major deficiencies would be appropriate. Luoma will want us to prepare a rebuttal paper, but I think our primary message to Luoma should be that his review process, no doubt with friendly reviewers, has failed to identify major problems that should have made this paper unpublishable in its current form. I suggest we ask him to get one more review, by us. Then, he can decide how our comments should be handled by Sommer et. al.

The problem with the rebuttal paper is time. We can expect months of delay in getting a response published. In the meantime, the agencies will memorialize this nonsense in every document they produce, including the BAs, BOs, and SWRCB flow proceedings..

BJ

On May 24, 2012, at 4:40 PM, [lfryer@l-squared.com](mailto:lfryer@l-squared.com) wrote:

Dennis Murphy's additional concerns are noted below in red. Lloyd

There are more issues. Especially two overarching ones. First, is the misuse of essential terminology. Plain and simple, from "habitat" to "population," Sommer mischaracterizes the very foci of the so-called study. It is ecologically incompetent on the conceptual and technical fronts.

And, second, more importantly, is the presentation of ostensible facts that are often not so -- oddly parallel to his migration paper — accompanied by conclusion statements that are not linked to those "facts" empirically.

Combined the paper is not an analysis of information but an exercise in unsupported assertion, and its publication becomes the vehicle for institutionalizing the assertions. This piece is not "science" in any interpretation, which is rather a problem to us.

---

**From:** [lfryer@l-squared.com](mailto:lfryer@l-squared.com)

**Sent:** Thursday, May 24, 2012 2:56 PM

**To:** 'Valerie Connor'; Simonek,Laura J; Jerry Johns; Jason Peltier; Becky Sheehan; BJ Miller; Brenda Burman; David Fullerton; Dennis Murphy; Frances Brewster; lara; laura; Lynda Smith; M Ward; Rick Sitts; Sheila Greene; Tom Mongan

**Cc:** Byron Buck; Hamilton, Scott

**Subject:** RE: Delta Smelt Habitat Paper Submitted



The major concerns are:

- Practically all of the references in the document are from prior to when regular monitoring occurred in the Cache Slough/Deep Water Ship Channel regions, therefore it perpetuates all of the X2-centric dogma we've struggled with for so long, including that delta smelt are migratory whose larvae must be flushed to the low salinity zone, and that the LSZ is the "core" habitat area.
- Its calculations of the distribution centroids are based on presence/absence rather than densities of delta smelt, which ends up suggesting the fish are closer to X2 than they would be if densities were considered instead.
- It perpetuates the warped definition of "habitat" that is in vogue, e.g., it's mostly defined by salinity, while under-emphasizing food.
- Migration is presented as a fact when it's not; habitat needs of spawning fish is not discussed.
- No discussion of why the south delta is no longer good habitat.
- Importance of Cache Slough region is skimmed over. Relevance of habitat types in Cache Slough region is not mentioned. Mentioned as an anomaly instead as a bona fide habitat area.
- Blind acceptance of Feyrer et al. 2007 even after the judge excoriated it.
- Turbidity discussion needs to be broken down by life stage.
- Suisun Bay discussion is inadequate; a more turbid environment won't solve the food problem.
- Napa River use misrepresented.
- Habitat types discussion is void of useful information.
- Future of delta smelt habitat fails to identify areas that would be preferable for habitat restoration based on its resiliency to levee failure.
- It assumes calanoid copepods are the primary food of delta smelt instead of referencing Steve Slater's diet data. This is the same error that MacNally et al. (2010) and Thomsen et al. (2010) made.
- It completely ignores the habitat characteristics by life stage table we provided to Ted Sommer, instead sticking with the poorly constructed and unhelpful table of "habitat types in which delta smelt have been collected", which is presence/absence based.
- It completely ignores the recently published Merz et al. (2012).
- It doesn't adequately answer any of the major questions posed at the beginning of the paper (e.g., (1) what are the basic physical, chemical, and biological requirements for delta smelt habitat? (2) What geographic areas currently provide these conditions? (3) What habitat types support delta smelt? (4) Given factors such as climate change, will the upper estuary provide suitable conditions in the future?).

Dennis Murphy may have identified other concerns.

Lloyd

---

**From:** Valerie Connor [<mailto:VConnor@sfcwa.org>]

**Sent:** Thursday, May 24, 2012 11:24 AM

**To:** Simonek, Laura J; Jerry Johns; Jason Peltier; Becky Sheehan; BJ Miller; Brenda Burman; David Fullerton; Dennis Murphy; Frances Brewster; lara; laura; [lfryer@l-squared.com](mailto:lfryer@l-squared.com); Lynda Smith; M Ward; Rick Sitts; Sheila Greene; Tom Mongan; Valerie Connor

**Cc:** Byron Buck; Hamilton, Scott

**Subject:** FW: Delta Smelt Habitat Paper Submitted

Here is Ted's smelt manuscript.

Lloyd and Dennis,

Can you refresh our collective memories on this. How many of our original concerns persist? Why don't they cite Hamilton and Murphy or Merz and Hamilton?

I rode the train with Ted Sommer this morning and had a great discussion on where "we" all agree. He said that many agency disbelievers now understand the significance of food. The MAST analysis points out that food was a major driver for smelt even before the fall. The comparison of 2010-11 with 2005-6 also points out the importance of summer temperatures. Even with high flows smelt do poorly when they are cooked.

We need to submit comments on this manuscript, but I'd like to take the JFF approach that was used in Lloyd's review of the POD synthesis report. I will ask Sam Luoma if I can provide a review of the paper to him (and Ted).

Valerie Connor, PhD

Science Program Manager

State and Federal Contractors Water Agency

1121 L St., Suite 806

Sacramento, CA 95814

office: [\(916\) 476-5053](tel:9164765053)

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[VConnor@sfcwa.org](mailto:VConnor@sfcwa.org)

---

**From:** Simonek,Laura J [<mailto:lsimonek@mwdh2o.com>]

**Sent:** Thursday, May 24, 2012 10:43 AM

**To:** Valerie Connor

**Cc:** [jpeltier@westlandswater.org](mailto:jpeltier@westlandswater.org)

**Subject:** FW: Delta Smelt Habitat Paper Submitted

Val: Good morning. Can you distribute to the tech team. Let's get a review if possible. Thanks! L

---

**From:** Jason Peltier [<mailto:jpeltier@westlandswater.org>]

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**From:** Sheila Greene  
**Sent:** Tuesday, May 29, 2012 11:44 AM  
**To:** 'Valerie Connor'  
**Subject:** RE: Delta Smelt Habitat Paper Submitted

Ok, but ugh

---

**From:** Valerie Connor [mailto:VConnor@sfcwa.org]  
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**To:** [lfryer@l-squared.com](mailto:lfryer@l-squared.com)

**Cc:** Valerie Connor; Simonek, Laura J; Jerry Johns; Jason Peltier; Becky Sheehan; Brenda Burman; David Fullerton; Dennis Murphy; Frances Brewster; Lauren Bauer ([lbauer@kcwa.com](mailto:lbauer@kcwa.com)); Lynda Smith; M Ward; Rick Sitts; Sheila Greene; Tom Mongan; Byron Buck; Hamilton, Scott

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Another statement of beliefs presented as science.

What do we do about this? I think a letter to Luoma pointing out these major deficiencies would be appropriate. Luoma will want us to prepare a rebuttal paper, but I think our primary message to Luoma should be that his review process, no doubt with friendly reviewers, has failed to identify major problems that should have made this paper unpublishable in its current form. I suggest we ask him to get one more review, by us. Then, he can decide how our comments should be handled by Sommer et. al.

The problem with the rebuttal paper is time. We can expect months of delay in getting a response published. In the meantime, the agencies will memorialize this nonsense in every document they produce, including the BAs, BOs, and SWRCB flow proceedings..

BJ

On May 24, 2012, at 4:40 PM, [lfryer@l-squared.com](mailto:lfryer@l-squared.com) wrote:

Dennis Murphy's additional concerns are noted below in red. Lloyd

There are more issues. Especially two overarching ones. First, is the misuse of essential terminology. Plain and simple, from "habitat" to "population," Sommer mischaracterizes the very foci of the so-called study. It is ecologically incompetent on the conceptual and technical fronts.

And, second, more importantly, is the presentation of ostensible facts that are often not so -- oddly parallel to his migration paper — accompanied by conclusion statements that are not linked to those "facts" empirically.

Combined the paper is not an analysis of information but an exercise in unsupported assertion, and its publication becomes the vehicle for institutionalizing the assertions. This piece is not "science" in any interpretation, which is rather a problem to us.



---

**From:** [lfryer@l-squared.com](mailto:lfryer@l-squared.com)

**Sent:** Thursday, May 24, 2012 2:56 PM

**To:** 'Valerie Connor'; Simonek, Laura J; Jerry Johns; Jason Peltier; Becky Sheehan; BJ Miller; Brenda Burman; David Fullerton; Dennis Murphy; Frances Brewster; lara; laura; Lynda Smith; M Ward; Rick Sitts; Sheila Greene; Tom Mongan

**Cc:** Byron Buck; Hamilton, Scott

**Subject:** RE: Delta Smelt Habitat Paper Submitted

The major concerns are:

- Practically all of the references in the document are from prior to when regular monitoring occurred in the Cache Slough/Deep Water Ship Channel regions, therefore it perpetuates all of the X2-centric dogma we've struggled with for so long, including that delta smelt are migratory whose larvae must be flushed to the low salinity zone, and that the LSZ is the "core" habitat area.
- Its calculations of the distribution centroids are based on presence/absence rather than densities of delta smelt, which ends up suggesting the fish are closer to X2 than they would be if densities were considered instead.
- It perpetuates the warped definition of "habitat" that is in vogue, e.g., it's mostly defined by salinity, while under-emphasizing food.
- Migration is presented as a fact when it's not; habitat needs of spawning fish is not discussed.
- No discussion of why the south delta is no longer good habitat.
- Importance of Cache Slough region is skimmed over. Relevance of habitat types in Cache Slough region is not mentioned. Mentioned as an anomaly instead as a bona fide habitat area.
- Blind acceptance of Feyrer et al. 2007 even after the judge excoriated it.
- Turbidity discussion needs to be broken down by life stage.
- Suisun Bay discussion is inadequate; a more turbid environment won't solve the food problem.
- Napa River use misrepresented.
- Habitat types discussion is void of useful information.
- Future of delta smelt habitat fails to identify areas that would be preferable for habitat restoration based on its resiliency to levee failure.
- It assumes calanoid copepods are the primary food of delta smelt instead of referencing Steve Slater's diet data. This is the same error that MacNally et al. (2010) and Thomsen et al. (2010) made.
- It completely ignores the habitat characteristics by life stage table we provided to Ted Sommer, instead sticking with the poorly constructed and unhelpful table of "habitat types in which delta smelt have been collected", which is presence/absence based.

- It completely ignores the recently published Merz et al. (2012).
- It doesn't adequately answer any of the major questions posed at the beginning of the paper (e.g., (1) what are the basic physical, chemical, and biological requirements for delta smelt habitat? (2) What geographic areas currently provide these conditions? (3) What habitat types support delta smelt? (4) Given factors such as climate change, will the upper estuary provide suitable conditions in the future?).

Dennis Murphy may have identified other concerns.

Lloyd

---

**From:** Valerie Connor [<mailto:VConnor@sfcwa.org>]

**Sent:** Thursday, May 24, 2012 11:24 AM

**To:** Simonek, Laura J; Jerry Johns; Jason Peltier; Becky Sheehan; BJ Miller; Brenda Burman; David Fullerton; Dennis Murphy; Frances Brewster; lara; laura; [lfryer@l-squared.com](mailto:lfryer@l-squared.com); Lynda Smith; M Ward; Rick Sitts; Sheila Greene; Tom Mongan; Valerie Connor

**Cc:** Byron Buck; Hamilton, Scott

**Subject:** FW: Delta Smelt Habitat Paper Submitted

Here is Ted's smelt manuscript.

Lloyd and Dennis,

Can you refresh our collective memories on this. How many of our original concerns persist? Why don't they cite Hamilton and Murphy or Merz and Hamilton?

I rode the train with Ted Sommer this morning and had a great discussion on where "we" all agree. He said that many agency disbelievers now understand the significance of food. The MAST analysis points out that food was a major driver for smelt even before the fall. The comparison of 2010-11 with 2005-6 also points out the importance of summer temperatures. Even with high flows smelt do poorly when they are cooked.

We need to submit comments on this manuscript, but I'd like to take the JFF approach that was used in Lloyd's review of the POD synthesis report. I will ask Sam Luoma if I can provide a review of the paper to him (and Ted).

Valerie Connor, PhD

Science Program Manager

State and Federal Contractors Water Agency

1121 L St., Suite 806

Sacramento, CA 95814

office: [\(916\) 476-5053](tel:(916)476-5053)

cell: [\(530\) 219-9295](tel:(530)219-9295)

[VConnor@sfcwa.org](mailto:VConnor@sfcwa.org)

---

**From:** Simonek,Laura J [<mailto:lsimonek@mwdh2o.com>]  
**Sent:** Thursday, May 24, 2012 10:43 AM  
**To:** Valerie Connor  
**Cc:** [jpeltier@westlandswater.org](mailto:jpeltier@westlandswater.org)  
**Subject:** FW: Delta Smelt Habitat Paper Submitted

Val: Good morning. Can you distribute to the tech team. Let's get a review if possible. Thanks! L

---

**From:** Jason Peltier [<mailto:jpeltier@westlandswater.org>]  
**Sent:** Thursday, May 24, 2012 7:07 AM  
**To:** T Birmingham; Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Burman,Brenda W; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning;[frances.mizuno@sldmwa.org](mailto:frances.mizuno@sldmwa.org); Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Simonek,Laura J; LLOYD Fryer; 'Martin McIntyre'; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Patterson,Roger K; Rose Schlueter; Sheila Greene; Arakawa,Stephen N; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'  
**Subject:** FW: Delta Smelt Habitat Paper Submitted

---

**From:** Jerry Meral [<mailto:jerry.meral@resources.ca.gov>]  
**Sent:** Wednesday, May 23, 2012 7:52 PM  
**To:** King Moon, Laura; [rpatterson@mwdh2o.com](mailto:rpatterson@mwdh2o.com); [jpeltier@westlandswater.org](mailto:jpeltier@westlandswater.org)  
**Cc:** Karla Nemeth; Carl Wilcox  
**Subject:** FW: Delta Smelt Habitat Paper Submitted

I think this will help with our habitat efforts.

Jerry

---

**From:** Sommer, Ted [<mailto:tsommer@water.ca.gov>]  
**Sent:** Monday, May 21, 2012 10:23 AM  
**To:** Jerry Meral  
**Cc:** Messer, Dean F.; Spaar, Stephani; McEwan, Dennis  
**Subject:** Delta Smelt Habitat Paper Submitted

Jerry,

Thanks for your patience on the delta smelt habitat white paper. I wanted to let you know that I submitted the attached paper today to the journal San Francisco Estuary and Watershed Science. I was able to take advantage of quiet BDCP week (i.e. no long reviews), plus I finally got the material I needed from my co-author, who left DWR this fall to go back to grad school.

Note that I had already provided copies of the last draft to the BDCP consultants, who incorporated some of the information into their analyses.

Don't hesitate to let me know if you have any questions.

Regards,

Ted Sommer, PhD

Program Manager II

California Department of Water Resources

3500 Industrial Blvd

West Sacramento CA 95691-6521

Mailing Address: PO Box 942836

Sacramento CA 94236-0001

Tel: [916-376-9772](tel:916-376-9772)

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**From:** Jason Peltier

**Sent:** Friday, June 1, 2012 3:25 PM

**To:** Sheehan, Rebecca D; T Birmingham; Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear, Adam C; Laura King Moon; Laura Simonek; LLoyd Fryer; Martin McIntyre; Mike Henry; Mike Wade; Neudeck, Randall D; Philp, Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** like.

## Gov. Jerry Brown plans to fast-track high-speed rail through courts

By Mike Rosenberg

[mrosenberg@mercurynews.com](mailto:mrosenberg@mercurynews.com)

mercurynews.com

Posted: 06/01/2012 11:40:47 AM PDT

June 1, 2012 9:41 PM GMTUpdated: 06/01/2012 02:41:59 PM PDT

Gov. Jerry Brown is proposing to fast-track the \$69 billion high-speed rail project through the courts by easing legal scrutiny under the state's landmark environmental law, this newspaper learned today.

The proposal, which the Legislature would have to approve this month as part of launching construction on the state's biggest-ever project, does not change the California Environmental Quality Act in any way but has two major ramifications for the bullet train and state.

First, it virtually takes away the final bullet in the chamber that project opponents were hoping to use in a last-ditch attempt to kill high-speed rail: a court-ordered injunction halting construction.

Under Brown's proposal, the train foes would have to prove in court that the project causes a major environmental problem, as in wiping out an endangered species or damaging extremely valuable land. Usually, they would have to convince a judge only of a minor problem with the project -- for instance, that the state did not adequately study the impacts of moving a road to make way for the tracks.

Project opponents on the Peninsula and beyond have repeatedly used this tactic successfully in the past few years to delay planning on the project by complaining of minor issues -- and Central Valley farmers are expected to file a similar CEQA lawsuit today.

Second, Brown's plan adds to a growing number of large-scale projects that the governor and his predecessor, Gov.

---

Arnold Schwarzenegger, have tried to exempt from the most intense environmental legal scrutiny under the grounds that California needs the projects immediately to create jobs.

Their argument holds that the electric trains will clean California air by taking cars off the road, and that delay caused by court injunctions would prevent them from ever completing the train.

"We believe that high-speed rail has tremendous environmental benefits for the state, and we want to do it in the right way," said Dan Richard, who Brown appointed to chair the California High-Speed Rail Authority. "We believe these are some technical issues, and we're not trying to seek any broad-scale exemptions with CEQA."

The formal proposal was expected to be detailed publicly next week, but already environmentalists and opponents briefed on the plan's outline were outraged.

"If there is ever a public contemporary project that needs to go through full environmental review, it's this one," said Kathryn Phillips, director of Sierra Club California, who called the plan foolish. "We have absolutely no tolerance for providing any kind of jailbreak for environmental review of this project."

Anja Raudabaugh, executive director of the Madera County Farm Bureau, which is joining the county, other farmers and dairy companies in filing a CEQA lawsuit today, said environmental scrutiny should be tighter -- not looser -- for the bullet train. It's so huge that the tracks could "catastrophically harm" resources like agriculture, water and low-income housing, she said.

"It's like denying California's vital resources their constitutional rights," Raudabaugh said. "I don't see how this project can be viewed as being above the law."

Stuart Flashman, an Oakland-based environmental attorney who has sued the project for Palo Alto, Menlo Park and Atherton, said they might sue to stop the legislation.

"Hell, if they're going to do those sorts of things, why not just give (the project) a total exemption?" Flashman said. "Why not just get rid of CEQA altogether?"

But labor groups who stand to get thousands of jobs from the project argue the court battles are more an avenue for opponents to stop the project on philosophical grounds and don't truly serve to protect the environment.

"California is littered with really good projects that have failed the CEQA test not because they were environmentally unsound but because groups have figured out how to litigate," said Jim Earp, executive director of the California Alliance for Jobs. "I don't think that the high-speed rail project will go forward in an environmentally irresponsible way."

The Brown administration stresses that the rules would apply only to high-speed rail and would not in any way re-write CEQA or impact environmental reviews for high-speed rail, only the court challenges. But environmentalists argue the rail authority could speed through its reviews on topics like air quality, water quality, traffic and the like, knowing it could will have an easier job defending its plans in the courts.

The proposal would give judges the power to allow construction of the line to begin in the Central Valley later this year even if opponents win a court case against the project. Instead of halting construction with an injunction -- causing California to lose federal grants, which would essentially kill the development -- the rail authority would be able to start building while fixing whatever problems the judge finds.

Also, the proposal would prevent opponents in the Bay Area from suing over a newer plan to run high-speed rail along the Caltrain corridor on two tracks, as opposed to the older four-track plan. Though most local leaders in the Peninsula and around California prefer the two-track option since it saves billions of dollars and prevents the tracks from wiping out several homes and businesses near the line, opponents see it as an opportunity to grind planning to a halt by suing since the plan wasn't previously studied. Richard noted the two-track option will still be studied later.

The Legislature by the end of this month is planning to vote on the exemptions as part of Brown's proposal to spend \$2.7 billion in state bonds, matching \$3.3 billion in federal grants, to start building up to 130 miles of high-speed rail track near Fresno. The entire 520-mile system would connect San Francisco and Los Angeles by 2029 if the remaining 80 percent of funding can be found.

The bullet train is the latest mega-project to get special environmental focus in Sacramento in the name of speeding up construction to create jobs.

Last year, Brown signed legislation forcing opponents of a planned NFL stadium in Los Angeles to skip right to the appellate court when filing environmental lawsuits. And in 2009, Schwarzenegger proposed largely exempting 10 large highway projects from environmental review.

"The more (exemptions) are allowed, the more it's going to be sought. That's the problem, that's the slippery slope that's created by these special exemptions," said Joel Reynolds, a senior attorney for NRDC. "Once you begin slicing away at CEQA, pretty soon the statute is gone. We simply can't have that because CEQA is the bedrock of environmental protection in California."



**From:** Jason Peltier

**Sent:** Monday, June 4, 2012 9:34 AM

**To:** T Birmingham; Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLoyd Fryer; Martin McIntyre; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheehan,Rebecca D; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** Someone obviously briefed them in depth....

---

**From:** Jason Peltier [mailto:jpeltier@westlandswater.org]

**Sent:** Monday, June 04, 2012 9:32 AM

**Subject:** SFChron

## CHRONICLE EDITORIALS

### California Peripheral canal coming soon

San Francisco Chronicle June 3, 2012 04:00 AM [Copyright San Francisco Chronicle. All rights reserved. This material may not be published, broadcast, rewritten or redistributed.](#)

Sunday, June 3, 2012

While the future of a proposed high-speed railroad to move people in California remains in doubt, a proposed giant canal to move water from Northern California to the south appears almost assured - with a little help from Washington. Now the questions are: How big? And whose hand is on the spigot?

The project - 30 years in the making, including six years of scientific study funded by water agencies, and known euphemistically as a conveyance facility and politically as the Peripheral Canal - hit a logjam last month. A raft of scientific reports suggested that what the state water contractors wanted - more water - would conflict with what the state and federal government are legally obligated to do - restore fish habitat.

So state water planners asked the contractors to spend more than the \$150 million they have already spent on scientific studies. The contractors balked, and the Kern County Water Agency Board of Directors demanded that the state and federal agencies deliver a description of the project (the legal green light to build) by June or it might walk.

Two weeks later, federal officials took over the show. The Interior Department convened meetings near San Francisco with state water and fish officials to discuss what a canal or tunnel the fish agencies would issue a permit to operate might look like. The fish agencies said: one

that would export between 4.5 million acre feet and 5.5 million acre feet a year. (The state exports 4.9 million acre feet now, and the delta ecosystem is suffering.)

That range now will serve as the rough outline of the project the water contractors are demanding. Also agreed: a 15-year window to figure out how to run the canal, begin aggressive wetlands restorations work and a process to adjust operations as new data came in.

The contractors did give on what they really wanted: a project to export 5.9 million acre feet because the fish agencies said it was not possible. Now they must determine: Does it make economic sense for them to spend \$12 billion or more on a canal that might deliver less water?

Will their customers be able to pay more for water and still grow almonds or other crops profitably?

Environmental advocates, whose views on the canal range from no canal to a yes-but-divert-less-water canal, rejoiced that *reduced* water exports finally were on the table for negotiation. Yet the question remains: Will this plan reduce reliance on delta water, as state law demands?

Those who live in the Sacramento-San Joaquin River Delta area, however, are outraged. Rep. Jerry McNerney, D-Stockton, whose newly drawn congressional district wraps the delta's eastern side where the "chunnel" would be built is one. "The problem is they started with the answer and are looking for data to support it," he said.

"There are better ways to supply water to Southern California than taking the Sacramento River away from us."

For the Bay Area, including the 3 million residents and businesses who depend on delta water, many questions remain:

-- How can the state commit to building a canal if we don't know if ecosystem needs or water contracts determine operations? (State law calls for "co-equal" uses.)

-- If the process is based on science rather than politics, then who asks the scientific questions?

-- What assurances are in place that fishermen will get some amount of water for fish, and that cities will get good quality drinking water?

Water-saving technology has helped the state conserve enough water that urban use has remained flat since the mid-1990s despite a growing population, and agricultural use has declined since the 1980s, according to a Public Policy Institute of California report. However, Californians can - and must - do more. The new plan includes a nod to more recycling, conservation and reservoirs, ideas that were disparaged in earlier discussions.

In short, there is much we don't know. We do know it looks like water contractors will get their canal.

Read more: <http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2012/06/01/INAT1MO1ES.DTL#ixzz1wqI3y6Q1>

**From:** Bernhardt, David L.  
**Sent:** Wednesday, June 6, 2012 2:01 PM  
**To:** kclark@westlandswater.org  
**Subject:** Salazar meeting

Karen: Salazar can meet at 10 on the 13<sup>th</sup>, does that work?

David Longly Bernhardt  
Brownstein Hyatt Farber Schreck, LLP  
1350 I Street, NW, Suite 510  
Washington, DC 20005-3305  
tel 202.872.5286  
fax 202.296.7009

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**From:** Karen Clark  
**Sent:** Wednesday, June 6, 2012 3:55 PM  
**To:** 'Bernhardt, David L.'  
**Subject:** RE: Salazar meeting

Hi David,

I'm sorry for not getting back to you sooner. To answer your question, yes, Tom is available on the 13<sup>th</sup> at 10:00 a.m.

*~Karen*

Karen Clark  
Executive Assistant to Thomas W. Birmingham  
Westlands Water District  
P.O. Box 6056  
Fresno, CA 93710  
(c) [REDACTED]  
(f) 559.241.6277  
Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

---

**From:** Bernhardt, David L. [mailto:DBernhardt@BHFS.com]  
**Sent:** Wednesday, June 06, 2012 2:01 PM  
**To:** [kclark@westlandswater.org](mailto:kclark@westlandswater.org)  
**Subject:** Salazar meeting

Karen: Salazar can meet at 10 on the 13<sup>th</sup>, does that work?

David Longly Bernhardt  
Brownstein Hyatt Farber Schreck, LLP  
1350 I Street, NW, Suite 510  
Washington, DC 20005-3305  
tel 202.872.5286  
fax 202.296.7009

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**From:** Bernhardt, David L.  
**Sent:** Wednesday, June 6, 2012 4:03 PM  
**To:** Karen Clark  
**Subject:** Re: Salazar meeting

Thanks

David Bernhardt  
[REDACTED]

On Jun 6, 2012, at 6:55 PM, "Karen Clark" <[kclark@westlandswater.org](mailto:kclark@westlandswater.org)> wrote:

Hi David,

I'm sorry for not getting back to you sooner. To answer your question, yes, Tom is available on the 13<sup>th</sup> at 10:00 a.m.

*~Karen*

Karen Clark

Executive Assistant to Thomas W. Birmingham

Westlands Water District

P.O. Box 6056

Fresno, CA 93710

(c) [REDACTED]

(f) 559.241.6277

Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

---

**From:** Bernhardt, David L. [mailto:[DBernhardt@BHFS.com](mailto:DBernhardt@BHFS.com)]  
**Sent:** Wednesday, June 06, 2012 2:01 PM  
**To:** [kclark@westlandswater.org](mailto:kclark@westlandswater.org)  
**Subject:** Salazar meeting

Karen: Salazar can meet at 10 on the 13<sup>th</sup>, does that work?

David Longly Bernhardt  
Brownstein Hyatt Farber Schreck, LLP  
1350 I Street, NW, Suite 510  
Washington, DC 20005-3305  
tel 202.872.5286  
fax 202.296.7009

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**From:** Jason Peltier

**Sent:** Saturday, June 9, 2012 7:43 AM

**To:** T Birmingham; Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLoyd Fryer; Martin McIntyre; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheehan,Rebecca D; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** opportunity missed

[http://www.deltavisionfoundation.org/pdfs/Appendix\\_E\\_Open-ended\\_Survey\\_Questions\\_and\\_Responses\\_6-5-12.pdf](http://www.deltavisionfoundation.org/pdfs/Appendix_E_Open-ended_Survey_Questions_and_Responses_6-5-12.pdf)



**From:** Tom Birmingham

**Sent:** Monday, June 11, 2012 7:09 AM

**To:** 'Karen, Catherine'; 'Martella, Roger'; joe.findaro@akerman.com; 'Bernhardt, David L.'

**CC:** dperacchi@westlandswater.org

**Subject:** Map of California's Waterscape

**Attachments:** 5788041.jpg

Catherine,

Attached is a copy of a map of California's water resources. Is it possible to print color copies of this map for use during our meetings?

Tom

**From:** Karen, Catherine  
**Sent:** Monday, June 11, 2012 7:12 AM  
**To:** Tom Birmingham; Martella, Roger; joe.findaro@akerman.com; Bernhardt, David L.  
**CC:** dperacchi@westlandswater.org  
**Subject:** RE: Map of California's Waterscape

Yes absolutely – I will ask for 25.

Catherine Karen  
Sidley Austin LLP  
1501 K Street, NW  
Washington, DC 20005  
Tel: 202-736-8368  
Cell: 703-477-3449  
Fax: 202-736-8711  
[ckaren@sidley.com](mailto:ckaren@sidley.com)

---

**From:** Tom Birmingham [mailto:tbirmingham@westlandswater.org]  
**Sent:** Monday, June 11, 2012 10:09 AM  
**To:** Karen, Catherine; Martella, Roger; joe.findaro@akerman.com; 'Bernhardt, David L.'  
**Cc:** dperacchi@westlandswater.org  
**Subject:** Map of California's Waterscape

Catherine,

Attached is a copy of a map of California's water resources. Is it possible to print color copies of this map for use during our meetings?

Tom

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IRS Circular 230 Disclosure: To comply with certain U.S. Treasury regulations, we inform you that, unless expressly stated otherwise, any U.S. federal tax advice contained in this communication, including attachments, was not intended or written to be used, and cannot be used, by any taxpayer for the purpose of avoiding any penalties that may be imposed on such taxpayer by the Internal Revenue Service. In addition, if any such tax advice is used or referred to by other parties in promoting, marketing or recommending any partnership or other entity, investment plan or arrangement, then (i) the advice should be construed as written in connection with the promotion or marketing by others of the transaction(s) or matter(s) addressed in this communication and (ii) the taxpayer should seek advice based on the taxpayer's particular circumstances from an independent tax advisor.

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\*\*\*\*\*  
\*\*\*\*\*

**From:** Terry Erlewine

**Sent:** Tuesday, June 12, 2012 11:39 AM

**To:** Jason Peltier; Allison Febbo; Ara Azhderian; Brent Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLOYD Fryer; Martin McIntyre; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Larry Rodriguez; Roger Patterson; Rose Schlueter; Sheila Greene; Steve Arakawa; Sue Ramos; Tom Boardman; Tom Glover; Tom Mongan; Valerie Connor

**Subject:** RE: Phyllis Fox's paper

**Attachments:** SWCFreshwaterOutflow\_Exh260.pdf

We've found other reports related to 1987 SWRCB hearings. I'll start sending out.

---

**From:** Jason Peltier [mailto:jpeltier@westlandswater.org]

**Sent:** Thursday, May 24, 2012 7:08 AM

**To:** Allison Febbo; Ara Azhderian; Brent Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLOYD Fryer; 'Martin McIntyre'; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Larry Rodriguez; Roger Patterson; Rose Schlueter; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** FW: Phyllis Fox's paper

**From:** Jerry Johns [mailto:jjohnswater@gmail.com]

**Sent:** Wednesday, May 23, 2012 9:30 PM

**To:** [etiedemann@kmtg.com](mailto:etiedemann@kmtg.com); [jfeider@charter.net](mailto:jfeider@charter.net); [joyw@mid.org](mailto:joyw@mid.org); Allen Short; Andy Fecko; Anthony Andreoni; Ara Azhderian; Audrey Kelm; [bbuck@sfcwa.org](mailto:bbuck@sfcwa.org); Brenda Fotos; Brent ten Pas; Carl Torgenson; Craig T. Jones; Danny Merkeley; Dave Breninger; David Ansolabehere

**Cc:** B. J. Miller; Blair Jackson; Buzz Link; Don Imamura; Hari Modi; Lowell Watros; Nicholas Markevich; Norm Worthington; Rodgers, Kirk; Tom Mongan; Tom Patton; Walter Bourez

**Subject:** Fwd: Phyllis Fox's paper

Water and Power Policy Group,

At the WPPG meeting yesterday, many of you expressed interest in getting a copy of Phyllis Fox's paper on the likely "natural flows" in the Bay/Delta Estuary given all the flood plain habitat upstream. Here is a copy of her paper.

----- Forwarded message -----

From: **Jon Rubin** <[Jon.Rubin@sldmwa.org](mailto:Jon.Rubin@sldmwa.org)>

Date: Wed, May 23, 2012 at 8:27 AM

Subject:

To: "[jjohnswater@gmail.com](mailto:jjohnswater@gmail.com)" <[jjohnswater@gmail.com](mailto:jjohnswater@gmail.com)>

--

Jerry Johns

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**STATE WATER CONTRACTORS TESTIMONY**

**STATE WATER CONTRACTORS REPORT ON  
SAN FRANCISCO BAY**

**For submission on September 24, 1987**

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## 1. SUMMARY AND CONCLUSIONS

We have investigated the condition of San Francisco Bay. We have looked at how freshwater outflow from the Delta affects the Bay. We have analyzed the effects of flood control/water development on the Bay. What we have found contradicts much of the popular opinion about San Francisco Bay. We conclude that many of the things widely held to be true about the Bay, things that many people with genuine concern and considerable influence believe to be true, are, in fact, misconceptions. This report and the accompanying appendices present data showing that:

- It is NOT true that San Francisco Bay is in a state of "crisis"; or that "... this extraordinary natural resource is imperiled by too much water being exported from the Delta"; or that it is on the "verge of ecological collapse".
- It is NOT true that the natural freshwater outflow to the Bay from the Delta was about 28 million acre-feet per year and that this outflow has been cut 50-60% as a result of flood control/water development.
- It is NOT true that the incidence of "pulses" of large outflows has been reduced.
- It is NOT true that salinity is accumulating in the Bay.
- It is NOT true that pollutants are accumulating in the Bay because flood control/water development has cut Delta outflow to the point where pollutants are no longer being "flushed" from the Bay.
- It is NOT true that flood control/water development has severely altered the Bay by reducing freshwater outflow from the Delta.

From our analysis, we have reached the following conclusions:

- SAN FRANCISCO BAY IS NOT IN OR APPROACHING A STATE OF CRISIS.
- THE BAY IS NOT IN DANGER OF ECOLOGICAL COLLAPSE. IT DOES NOT EXHIBIT CHARACTERISTICS OF A SYSTEM ON THE VERGE OF COLLAPSE.
- BAY FISHERIES AND THE SUPPORTING ECOSYSTEM, AS A WHOLE, ARE IN GOOD CONDITION. FISHERY PROBLEMS INVOLVING STRIPED BASS AND DUNGENESS CRAB ARE LARGELY CAUSED BY CONDITIONS OUTSIDE THE BAY.
- WATER QUALITY IN THE BAY IS GENERALLY GOOD AND HAS IMPROVED IN RECENT YEARS.
- THE BAY IS NOT IN DANGER FROM EUTROPHICATION.
- THERE ARE SOME LOCALIZED POLLUTION PROBLEMS IN NEAR-SHORE AREAS RESULTING FROM INADEQUATELY CONTROLLED POLLUTANT DISCHARGES, INCLUDING URBAN RUNOFF.
- UNDER NATURAL CONDITIONS, DELTA OUTFLOW WAS ONLY 8-19 MILLION ACRE-FEET PER YEAR. IT IS NOW ABOUT 13 MILLION ACRE-FEET PER YEAR. SO, FLOOD CONTROL/WATER DEVELOPMENT HAS NOT REDUCED DELTA OUTFLOW BY 50-60%. IN FACT, DELTA OUTFLOW MAY NOW BE AT ABOUT THE LEVEL IT WAS UNDER NATURAL CONDITIONS.
- THE FREQUENCY AND DURATION OF HIGH DELTA OUTFLOWS, SOMETIMES REFERRED TO AS "PULSES", HAVE NOT CHANGED IN THE LAST 50-60 YEARS.



- THE BAY HAS UNDERGONE A NUMBER OF SIGNIFICANT CHANGES, INCLUDING THE INTRODUCTION OF OVER 100 SPECIES, HEAVY EXPLOITATION AND THEN CONTROL OF FISHERY RESOURCES, FILLING OF 40% OF THE BAY, AND ELIMINATION OF 80% OF ITS HIGHLY PRODUCTIVE TIDAL MARSHES. SERIOUS POLLUTION OCCURRED AS A RESULT OF MUNICIPAL AND INDUSTRIAL WASTEWATER DISCHARGES, AND THEN WAS CLEANED UP. FLOOD CONTROL/WATER DEVELOPMENT IS ONLY ONE OF THE FACTORS THAT HAS AFFECTED THE BAY, AND IT HAS NOT BEEN A MAJOR FACTOR.
- SAN FRANCISCO BAY IS BY NO MEANS A PRISTINE ECOSYSTEM. IT IS A SYSTEM THAT HAS UNDERGONE A NUMBER OF SIGNIFICANT CHANGES. WE ARE MANAGING A HIGHLY MODIFIED ESTUARY RATHER THAN PRESERVING A PRISTINE ENVIRONMENT.
- WE HAVE FOUND THREE AREAS OF INVESTIGATION THAT WOULD PROVIDE INFORMATION ESSENTIAL TO PROTECTION OF BENEFICIAL USES OF THE BAY:
  1. DETERMINE HOW OCCASIONAL SALINITY DECREASES CONTROL INVASIONS OF MARINE ORGANISMS (TO INSURE THAT THE BAY REMAINS AN ESTUARY RATHER THAN A MARINE EM-BAYMENT).
  2. QUANTIFY THE EFFECTS OF OCEANIC CONDITIONS ON THE BAY (SO WE DO NOT END UP TRYING, FRUITLESSLY, TO MAN-AGE CONDITIONS IN THE BAY THAT ARE LARGELY DETER-MINED BY UNCONTROLLABLE CONDITIONS IN THE OCEAN).

3. ASSESS THE EFFECTS OF URBAN RUNOFF AND OTHER UNCONTROLLED SOURCES OF POLLUTION AND DEVELOP PROGRAMS FOR THE REASONABLE PROTECTION OF BENEFICIAL USES AFFECTED BY THESE SOURCES (SO WE CAN SOLVE WHAT WE KNOW TO BE THE REMAINING PROBLEMS IN THE BAY).

## 2. INTRODUCTION

This report discusses the water quality in San Francisco Bay, pollutant discharges to the Bay, and the Bay's ecology, concluding that the Bay is in good condition. The status of Delta outflow is reviewed, as are localized pollution problems affecting the Bay. The historic changes in the Bay are recounted. Finally, information from studies on salinity, currents and the persistence and availability of pollutants are discussed. The report draws on the scientific literature, on previous testimony presented at the Bay-Delta Hearings, and on material in the Appendices to this report to establish the conclusions set forth in Section 1.

The following Appendices accompany this report:

Appendix 1	Pollutant Loadings to San Francisco Bay	K.P. Lindstrom and Associates
Appendix 2	Freshwater Inflow to San Francisco Bay Under Natural Conditions	Phyllis Fox
Appendix 3	Delta Outflow and the Fishery Resources of San Francisco Bay	TERA Environmental
Appendix 4	Stability of the San Francisco Bay-Delta Ecosystem	Alex J. Horne
Appendix 5	Butyltin in San Francisco Bay	K.P. Lindstrom and Associates
Appendix 6	Salinity and Temperature Variations in San Francisco Bay	Phyllis Fox

Appendix 7	Hydrodynamics of the Southern Reach	Phyllis Fox
Appendix 8	Persistence of Pollutants in the Environment	Marv Jung Associates
Appendix 9	Increase in Bioavailability of Heavy Metals with High Delta Outflow	Marv Jung Associates

### 3. WATER QUALITY HAS IMPROVED

Bay water quality has improved significantly in the recent past. A 1987 report [Condit, 1987] to the San Francisco Bay Regional Water Quality Control Board [SFBRWQCB] states:

"Water quality in San Francisco Bay has visibly improved in the last 20 years. Untreated sewage is no longer routinely discharged at the shoreline. The foul odors and unsightly evidence of raw sewage discharges once prevalent in the Bay no longer exist. Since 1960, over three billion dollars have been spent in the Bay Area to upgrade and construct wastewater treatment plants and to move outfalls into deep water offshore. Because of the cooperative efforts of dischargers, public regulatory and resource agencies, and the public, the bacteriological conditions in the Bay improved 5 to 16 fold between 1973 and 1976, and swimming is now safe in most areas of the Bay during summer. Bay water quality has improved to the point where public harvesting of shellfish in San Mateo County was approved in 1982, 1983 and 1985 - the first time in 50 years.

The Bay south of Dumbarton Bridge has experienced the most dramatic improvement in dissolved oxygen [DO]. As a result of improved DO and creation of a low salinity regime by discharge of tertiary effluents, the Bay shrimp *Crangon franciscorum* are abundant in the area, re-establishing a viable commercial bait fishery."

In 1986, the State Water Resources Control Board prepared an assessment of water quality limited segments in California for the years 1984-1985. The assessment was prepared pursuant to the Clean Water Act to identify areas where designated beneficial uses are impaired. The 1986 SWRCB assessment identified only two water quality limited segments in the open waters of San Francisco Bay. They are:

1. 3,000 acres in South San Francisco Bay, where violations of dissolved oxygen, coliform and ammonia water quality objectives limit marine habitat, fish spawning and water contact recreation beneficial uses, and
2. 900 acres in Richardson's Bay between Tiburon and Sausalito, where violations of the coliform water quality objective limit shellfish harvesting and water contact recreation beneficial uses.

Note that none of these beneficial use impairments arise from contamination by toxic substances.

The California State Mussel Watch [SMW] is a long-term water quality monitoring program administered by the State Water Resources Control Board [SWRCB]. It provides an indication of geographical and year-to-year trends in toxic pollutants along the California Coast and in important bays and estuaries, including San Francisco Bay. The SMW uses transplanted or resident mussels to indicate the presence of pollution. These shellfish are efficient accumulators of potential toxic pollutants from ambient waters. Five open-water monitoring stations [Mare Island, Point Pinole, Treasure Island, San Mateo Bridge and Dumbarton Bridge] have been maintained over the past six years. According to the SWRCB's latest report, data from transplanted California mussels at these stations has shown that "San Francisco Bay is, on the whole, a relatively clean water body" [Hayes and Phillips, 1985]. No synthetic organic substances have been found in mussels at these open-water stations at levels exceeding U.S. Food and Drug Administration tolerances or action levels. The occasional readings of metals and synthetic chemicals in mussels in the Bay that are among higher percentiles of measurements taken statewide do not violate FDA limits, do not seem to be increasing, and are not accompanied by any known biological effects. Mussel Watch data from these open-water stations indicate that Bay water quality is generally superior to other urbanized bays on the West Coast of the U.S.

In regard to the Mussel Watch data, more than half of the statewide samples, including some in the Bay, have cadmium levels high in comparison to international shellfish standards. These high cadmium levels in California may be a natural phenomenon reflecting higher cadmium levels in offshore ocean waters. The finding of relatively high cadmium levels in reference areas remote from potential cadmium sources has also lead to speculation that the California mussel may accumulate some metals to a greater degree than other shellfish [Hayes and Phillips, 1985]

The Bay Area Dischargers Association [BADA], an organization of the five largest municipal wastewater dischargers in the San Francisco Bay Area, has presented testimony demonstrating that water quality data taken over the last ten years near major municipal discharges show improvement or unchanging high quality for dissolved oxygen, coliforms and un-ionized ammonia [BADA Exhibit 3, 1987, Section IV]. If there were significant widespread pollution problems in the Bay, conditions should be particularly bad near municipal discharges, but they are not. Bay Area Dischargers Association evidence also indicates that "studies designed to detect impacts of POTW [publically owned treatment works] discharges, and performed near two deep water discharges, have shown no discernible effects on the benthic communities found near those sites". BADA goes on to say that "a comprehensive five-year study of the South Bay, the portion of the Bay having the greatest concentration of POTW effluent, has demonstrated no detrimental biological effects due to pollutants from POTWs; in fact, the study provides supportive evidence that freshwater discharged from the advanced wastewater treatment facilities may be important in sustaining the Bay shrimp population in this region" [BADA Exhibit 3, 1987, pg. V-1].

According to Phillips (1987) "Most major estuaries exhibit enrichments of trace elements compared to offshore coastal waters, and the San Francisco Bay-Delta is no exception to this general rule." However, Bay Area Dischargers Association

testimony states that "concentrations of trace metals in the sediments and water column of most areas of the Bay have not increased over the last decade and generally have not exceeded EPA ambient saltwater criteria" [BADA Exhibit 3, 1987, pg. IV-1].

Bay-Delta hearing testimony submitted by the Aquatic Habitat Institute [Phillips, 1987, pp. 311-312] confirms that there is convincing evidence of a general improvement in Bay-Delta water quality following the improvement in sewage treatment facilities in the 1960s and 1970s, and that local effects on benthic communities around outfalls have been considerably reduced.

NOAA's National Status and Trends Program May 1987 report indicates that sediment concentrations of aromatic hydrocarbons, DDT residues, PCB's and the sewage indicators coprostanol and *clostridium perfringens* are low on Southamptton Shoal and in San Pablo Bay, as compared to other urban bays on the West Coast. The sediments near Oakland and Hunter's Point show contaminant levels comparable to, or somewhat lower than, those found in other urban bays on the West Coast. The ratios of trace elements to aluminum in Bay sediments do not appear particularly high in comparison to other estuaries, except for the ratio of chromium to aluminum in San Pablo Bay. This may be related to point-source discharges of chromium to the Bay.



#### **4. POLLUTANT DISCHARGES HAVE DECREASED**

Bay Area Dischargers Association testimony [BADA Exhibit 3, 1987], drawing in part on Condit's SFBRWQCB report [1987], demonstrates large decreases in discharge of pollutants from municipal treatment plants, in spite of significant increases in wastewater flow resulting from growth of the population served. Condit's 1987 report points out that "while Bay Area population and wastewater flows have doubled since 1955, BOD and suspended solids loadings have decreased by 86% and 77% respectively." Table 1, developed from BADA data [BADA Exhibit 3, 1987], shows more recent reductions achieved in municipal treatment plant pollutant loadings. Bay Area municipal treatment plants have also significantly reduced their discharges of heavy metals and trace organic chemicals. According to BADA, "Heavy metals discharged in 1985 were one-sixth of 1965 loadings and one-third of 1975 loadings" and "trace organics discharged in 1985 were one-fourth of estimated 1975 loadings" [BADA Exhibit 3, 1987, pg. III-9].

Information presented in Appendix 1 indicates that industrial discharges in the Bay area have decreased significantly since the 1950s, primarily as a result of discharge limitations imposed under the National Pollutant Discharge Elimination System [NPDES] program.

The effects of many municipal and industrial discharges have been reduced by moving the outfalls offshore. However, contaminant loadings to near-shore areas from uncontrolled urban runoff are probably growing as the amount of developed land and the population in the Bay Area continue to grow.

TABLE 1  
DECLINE IN BAY AREA MUNICIPAL TREATMENT PLANT  
POLLUTANT LOADINGS  
(Tons/Day)

Pollutant	1975	1985
BOD	180	29
Suspended Solids	123	32
Metals	1.29	0.42
Trace Organics	0.99	0.22

The analysis of pollutant loadings to San Francisco Bay in Appendix 1, as shown in Table 2, indicates that for many pollutants, Delta outflow is the main source of pollutant LOADING to the Bay. As shown in Table 3, the largest pollutant loadings occur during the high flow periods (winter and spring). The large volume of Delta outflow carries pollutants at low concentrations, and it is the concentration of pollutants that determines whether organisms experience harmful effects from pollution. So, it does NOT follow that Delta outflow is the main source of pollution PROBLEMS in the Bay. Consequently, pollutant loadings to the Bay exclusive of Delta outflow are presented in Table 4 to show the relative importance of various Bay Area sources of pollution in the Bay, and to indicate where further controls would be helpful.

Table 4 shows that contributions from non-point sources of pollution, including urban runoff, in San Francisco Bay are comparable to, or larger than, contributions from point sources. Pollution inputs from uncontrolled non-point sources such as urban runoff are particularly damaging to the Bay because they occur in near-shore areas. Near-shore areas are less affected by estuarine currents. Also, near-shore areas are often areas of considerable biological sensitivity, and areas where potential impairments of beneficial uses may be most noticeable.

Testimony by the Aquatic Habitat Institute [AHI] shows that the main inputs of most trace metals to the Bay are from Delta outflow and runoff from non-urban land [Gunther et al., 1987, pg. 308]. Gunther et al. also note that the EFFECTS of contaminants are completely distinct from their mass loadings. For example, the predominance of Delta outflow as a source of many trace element loads does NOT mean that Delta outflow is the main cause of any effects which may be detected. Again, this is because trace elements carried into the estuary in Delta outflow occur in low concentrations in a very large inflow volume.

TABLE 2

**ANNUAL WASTE LOADS INTO THE DELTA AND SAN FRANCISCO BAY**  
(Tons per year, unless otherwise indicated)

Parameter	Bay-Delta Total	Delta Outflow Total	San Francisco Bay Total
Flow (gallons x 10 <sup>9</sup> )	14,700 - 16,900	13,300 - 15,400	1,400 - 1,500
BOD	86,800 - 98,900	58,500 - 64,500	28,300 - 34,400
Total Suspended Solids	11,700,000 - 11,820,000	8,120,000 - 8,230,000	3,560,000 - 3,590,000
Total Nitrogen	42,800 - 84,000	13,400 - 36,200	29,400 - 47,800
Total Phosphorous	11,100 - 87,700	3,710 - 66,600	7,360 - 21,100
Petroleum Hydrocarbon	12,400 - 18,800	4,130 - 8,250	8,390 - 10,500
<b>METALS</b>			
Arsenic	106 - 120	66 - 75	40 - 45
Cadmium	51 - 179	46 - 172	5 - 7
Chromium	688 - 1,154	334 - 794	354 - 360
Copper	758 - 990	558 - 786	200 - 214
Lead	411 - 2,000	219 - 1,800	192 - 200
Mercury	5.2 - 7.5	4.4 - 6.5	0.8 - 1.0
Nickel	360 - 470	330 - 385	30 - 84
Zinc	1,800 - 2,100	1,270 - 1,570	528 - 527
<b>OTHER COMPOUNDS</b>			
PCB, lb/yr	Unknown	Unknown	27
Chlorinated Hydrocarbon Pesticides	1.78	1.2	0.58

TABLE 3

PERCENTAGE CONTRIBUTION OF POTENTIAL POLLUTANTS TO  
SAN FRANCISCO BAY FROM ALL SOURCES BY SEASON <sup>a</sup>

Constituent	Season			
	Winter	Spring	Summer	Fall
Flow	34	37	13	16
BOD	49	30	6	15
Total Suspended Solids	57	26	2	15
Total Phosphorous	28	32	20	20
Total Nitrogen	46	30	10	14
Arsenic	50	30	5	15
Cadmium	52	25	12	11
Chromium	57	27	3	13
Copper	53	28	6	13
Lead	50	30	3	17
Mercury	43	23	11	23
Zinc	53	27	6	14
Chlorinated Hydrocarbon Pesticides	18	38	22	22
Petroleum Hydrocarbons	32	27	15	26
PCB	54	26	0	20

<sup>a</sup> Includes 12 counties tributary and upstream of San Francisco Bay.

TABLE 4

**TYPICAL YEAR ANNUAL DIRECT POINT AND NONPOINT  
POLLUTANT LOADINGS TO THE SAN FRANCISCO BAY <sup>a</sup>**  
(Expressed in tons per year, unless otherwise indicated)

	Point Sources	Nonpoint Sources		S. F. Bay All Sources
		Urban Runoff	Total	Total
Flow, gallons x 10 <sup>9</sup>	911	227	606	1,517
BOD <sub>5</sub>	10,300	6,270	22,600	32,900
Total Suspended Solids	37,700	87,700	3,530,000	3,570,000
Total Nitrogen	28,200	2,700	19,600	47,800
Total Phosphorous	20,400	421	716	21,100
Petroleum Hydrocarbons	4,280	4,110	4,110	8,390
<b>METALS</b>				
Arsenic	<4.02	3	37.5	<41.5
Cadmium	<3.12	1	2	<5.12
Chromium	<14	5.5	341	<355
Copper	<35.9	16.5	164	<200
Lead	<17.8	91	183	<200
Mercury	<0.39	0.055	0.43	<0.82
Nickel	42.8	19.0	41	<83.6
Zinc	<69.5	97.5	465	<534
<b>OTHER COMPOUNDS</b>				
PCB, lb/year	0	27	27	<27
Chlorinated Hydrocarbon Pesticides, lb/year	Negligible	97	222	<222

<sup>a</sup> Includes all waters westerly of Chipps Island

AHI states that dredging and dredged material disposal "can be identified as a truly minor source of contaminants to the estuary under all conditions" [Gunther et al., 1987, pg. 524].

Between 1973 and 1982, the U.S. Coast Guard documented spills of more than a million gallons of oil and chemicals into the Bay and Delta [Jung et al., 1984]. An estimated 83 percent of the total was petroleum-derived compounds, including aviation and automobile fuel. In recent years, the annual amounts of oil spilled during transfer operations has decreased dramatically because of tightening pollution control laws and accompanying improvements in equipment and operational methods. The decline has been from about 30,000 gallons in 1975 to around 6,000 gallons in 1985. [Dowgiallo et al., 1986].

## **5. THE BAY ECOSYSTEM AS A WHOLE IS IN GOOD CONDITION**

### **A. CONDITION OF BAY FISHERIES**

To investigate the condition of the fisheries in San Francisco Bay, and prepare the analysis presented in Appendix 3, we reviewed:

- The status of two representative species, Pacific herring and Dungeness crab. These species were chosen because they are economically important, and extensive data are available to study them. In particular, the Pacific herring catch represents more than 90% of all the commercial fisheries inside the Bay.
- Commercial and party-boat fish harvest in San Francisco Bay and adjacent waters. This should provide a direct indication of any severe problems in the Bay Area fishery.

The results were as follows:

- The herring fishery is in good condition.
- The California Department of Fish and Game concluded that the primary factor leading to the decline of the Central California Dungeness crab fishery was a change in ocean conditions [e.g. changes in offshore currents and ocean temperature], possibly exacerbated by the effects of predation and pollution.
- The San Francisco Bay area continues to support a large and diverse commercial and recreational fishery. Commercial landings and sport catch per unit effort have remained relatively stable. This conclusion stands



despite the fact that detailed analysis of fish harvest by species is complicated by uncertainties in the relation between catch and abundance, the accuracy in reporting landings, the effects of market conditions, improvements in fishing technology, and incomplete data on catch location and angler effort.

Much attention has been devoted to problems affecting the salmon and striped bass populations that live in, or migrate through, San Francisco Bay. However:

1. THE DECLINE IN NATURALLY SPAWNING SALMON IS CAUSED BY  
UPSTREAM HABITAT REDUCTIONS, NOT CHANGES IN THE BAY

Figure 1, reproduced from SWC Exhibit 201 presented previously by the State Water Contractors, shows that the number of adult salmon in the San Francisco Bay-Delta system has remained relatively stable. Long-term trends in the commercial catch of Bay-Delta chinook salmon have also remained relatively stable since the early 1900s. More detailed information for 1953 through 1986 shows that adult salmon abundance, spawning escapement and commercial and sport fishing harvest have all remained relatively stable.

There has been a shift in the number of salmon spawning in Central Valley streams compared to the number of fish reared in hatcheries. This has resulted from such factors as:

- lower availability of suitable spawning gravels
- obstructions to upstream and downstream migrants
- increased channelization
- reductions in riparian vegetation

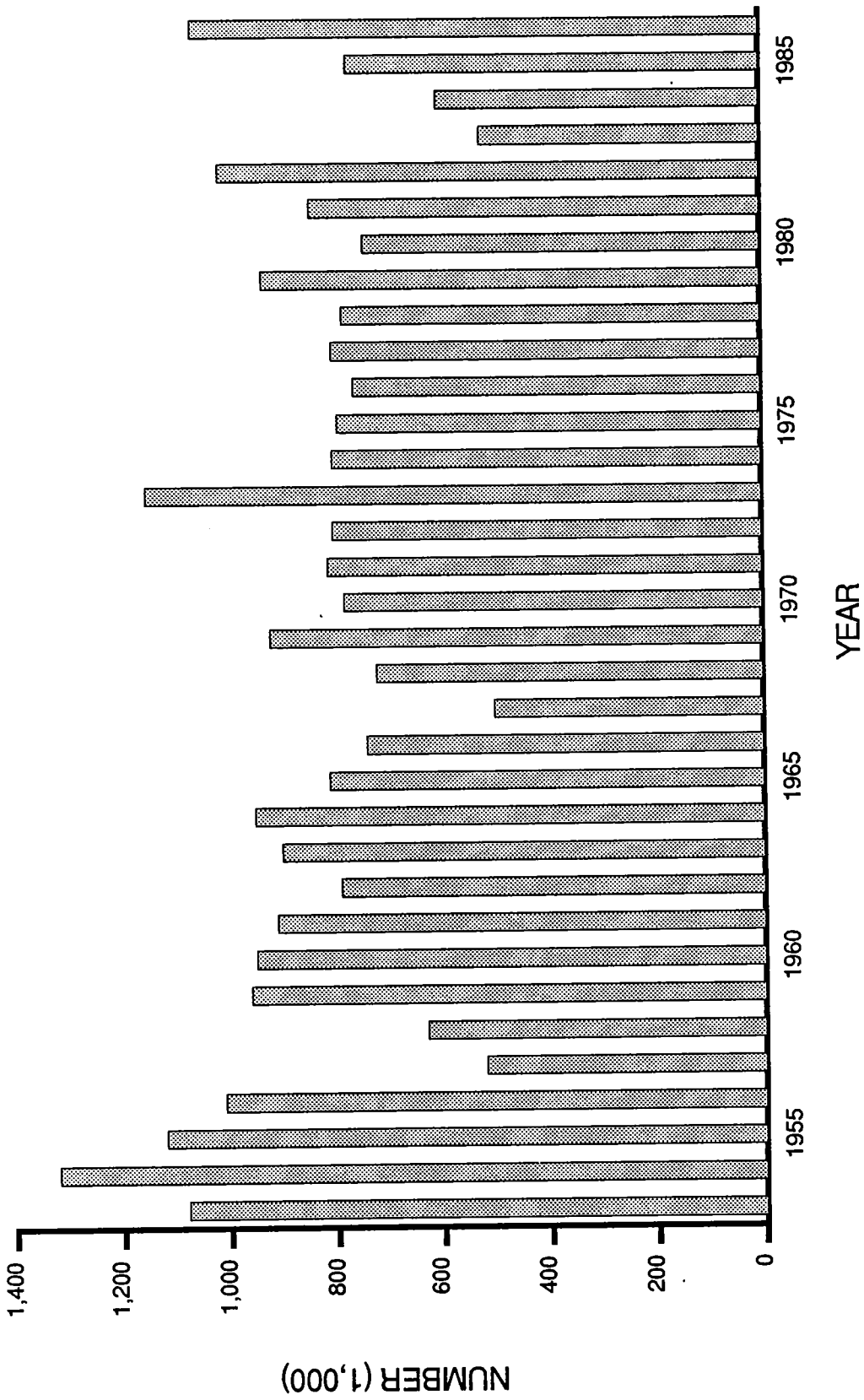


FIGURE 1 Abundance (Combined Total of Annual Escapement, Commercial and Ocean Sport Catch) of Chinook Salmon, 1953-1986.

- predation on juvenile salmon [e.g. at the Red Bluff Diversion Dam]
- losses at diversions.
- commercial and recreational fishing harvests.

The decrease in the numbers of stream-spawned salmon [natural spawners] has been offset by the production of hatchery-reared fish, which are often trucked downstream for release in the Delta to avoid losses between the hatcheries and the Bay. As a result, the total of hatchery fish and natural spawners has remained relatively constant over the years.

## 2. THE DECLINE IN STRIPED BASS RESULTS FROM FISHING PRESSURE, POLLUTION AND CHANGING CONDITIONS IN THE DELTA, RATHER THAN CONDITIONS IN THE BAY

Five reasons have been suggested for the recent decline of the striped bass population. These possibilities, discussed in previous testimony submitted by the State Water Contractors on striped bass, are:

- A reduced number of adults [especially very large older females], because of toxic effects, poaching and sport fishing pressure, resulting in reduced egg production.
- Declines in the food resources [prey] available for the survival and growth of larval and juvenile striped bass.
- Exposure to, and accumulation of, toxic substances adversely affecting reproductive success and survival of larval, juvenile, and adult striped bass.
- Entrainment losses of striped bass at water diversions.

- Changes in Delta hydraulics resulting in impacts on food supply, or transport of young striped bass into areas where they are less likely to survive.

There are strong indications, based on recent work by Sakanari and Moser [1987], that lesions found on striped bass in the Bay are NOT an indication of poor conditions in the Bay. Instead, these lesions result from an immune response to a parasite [*Lacistorhynchus dollfusi*] which the bass get by eating crustaceans that are hosts for the parasite. These lesions often become the site of secondary infections, and photographs of the affected fish have been widely featured in the press as an indication of poor conditions in the Bay.

## **B. CONDITION OF THE SUPPORTING ECOSYSTEM**

Appendix 4 contains a review of the status of submerged aquatic vegetation [SAV] in the Bay, done as part of an assessment of the condition of the ecosystem supporting the fishery in the Bay. SAV is a mixture of large underwater plants, primarily seaweeds and sea grasses, which grow in beds in the shallower regions of estuaries.

SAV is a key biological community in many estuaries. For example, in Chesapeake Bay, SAV are "vitally important to the (Chesapeake) Bay because of their value as large primary producers, food sources for waterfowl, habitat and nursery areas for many commercially important fish, controls for shoreline erosion, and mechanisms to buffer negative effects of excessive nutrients" [EPA, 1982]. In San Francisco Bay, SAV has a similar role. In addition, SAV is the site for egg deposition by the Pacific herring, the most important commercial fish species in the Bay.

Between 1965 and 1980, a catastrophic decline in the abundance and diversity of SAV occurred in Chesapeake Bay, signalling serious problems in the estuarine

ecosystem. The causes of the collapse of SAV in Chesapeake Bay have been ascribed to a combination of increased nutrients, decreased light, increased competition from suspended and attached algae [aufwuchs], and the effects of herbicides from inland drainages [EPA, 1982, 1983].

However, unlike Chesapeake Bay, San Francisco Bay has not suffered a widespread decline in SAV. Although measurements have been less extensive, the evidence indicates no change in the west-central Bay [CDFG, 1981-1987] and mixed increases and decreases in some species in east-central and South Bays [Horne and Fawcett, in preparation.]. Furthermore, the species composition of intertidal algae has remained similar over the last two decades in San Francisco Bay [DiSilva, 1979; Josselyn and West, 1985; Horne and Fawcett, in preparation.]. The conclusion is that there are no signs of significant problems in this major ecosystem component in San Francisco Bay.

Appendix 4 also presents information on barnacles and crabs in the rocky intertidal zone in Central San Francisco Bay. Barnacles are common all over the world and have been measured in the Bay at Kellers Beach since 1981. Because they are immobile and filter-feeders, barnacles integrate both pollution effects (via their food particles) and freshwater effects (via exposure to large volumes of water during feeding and breathing). Intertidal crabs are common, mobile feeders representing higher trophic levels because some species are large predators on mussels and snails. Where measurements have been made, San Francisco Bay's intertidal barnacles and crabs are as abundant as those in unpolluted waters in Europe and the Pacific Coast [Horne and Fawcett, in preparation.]. This indicates that this sub-ecosystem is healthy. This is especially important because the rocky intertidal zone is very sensitive to effects of floating pollutants such as oil spills and other surface film components which contain very large amounts of toxicants relative to the rest of the water.

A long-term study of a South San Francisco Bay mudflat was made by Nichols and coworkers for comparison with one in Puget Sound [Nichols, 1985; Nichols and Thompson, 1985]. No effects of wastewater or sewage were detected over the long term in San Francisco Bay. Wide fluctuations in biomass of various species occurred but the major die-off was due to smothering by drifting seaweeds [Nichols, 1985], a common effect in South and Central Bays [Horne and Nonamura, 1976; Josselyn and West, 1985; Horne and Wrigley, 1977].

Data on the abundance and species assemblage of selected benthic invertebrates [bottom-dwelling clams, worms and shrimp-like amphipods] are reviewed in Appendix 3, to check for evidence of damage to the ecosystem supporting the resident fishery in San Francisco Bay. The available data on the abundance of benthic invertebrates in the Bay provide no evidence that the supporting ecosystem for the Bay fishery is in poor condition.

### **C. BIOLOGICAL EFFECTS OF POLLUTANTS**

Testimony submitted by the Bay Area Dischargers Association states that "the most convincing evidence of a biological effect caused by pollutants is from starry flounder studies, which link elevated PCB [polychlorinated biphenyl] and PAH [polycyclic aromatic hydrocarbon] concentrations with reproductive interferences .... the major sources of PCBs and PAHs are atmospheric deposition, urban runoff and spills. NO OTHER RELATIONSHIPS HAVE BEEN SCIENTIFICALLY ESTABLISHED BETWEEN POLLUTANT CONCENTRATIONS AND DETRIMENTAL BIOLOGICAL EFFECTS IN THE BAY." [BADA Exhibit 3, 1987, pg. iii] [emphasis added].

## **D. EUTROPHICATION IS NOT A PROBLEM IN THE BAY**

As discussed in Appendix 4, eutrophication is the enrichment of waters by addition of plant nutrients. Cultural eutrophication is over-enrichment by human domestic and agricultural waste discharges. In many natural waters, eutrophication produces unwanted effects, including low dissolved oxygen levels; green, turbid water with unpleasant tastes and odors; increases in trash fish; decreases in game fish and shellfish; and fish kills [NSF, 1969; Parma, 1980]. Blue-green algae and dinoflagellates often become dominant.

In San Francisco Bay, there is a trend towards higher dissolved oxygen levels in tributaries and near-shore areas, and not a decline. The deeper waters of the Bay are fully saturated with dissolved oxygen, and can support all forms of estuarine life. Fluctuations around 100% oxygen saturation do occur in San Francisco Bay, but they result from physical effects [usually temperature changes], and not from decomposing plant or animal matter.

No decreases in the diversity and abundance of animal species has occurred in bottom waters [Nichols and Thompson, 1985]. No increase in characteristic eutrophication indicators, such as blue-green algae, have been reported [Horne and McCormick, 1977]. This finding is somewhat unexpected, given the large quantity of nutrients in the Bay. Although some reasons for this effect have been proposed for different parts of the Bay [e.g., Cloern, 1982; Smith and Horne, in press], a general theory still eludes us.

In conclusion, low dissolved oxygen levels are the most common initial indicator of ecological damage to estuaries. Dissolved oxygen levels are satisfactory in San Francisco Bay. No indicators of eutrophication (e.g., depletion of benthic animals or outbreaks of planktonic blue-green algae) indicate that San Francisco Bay is on the verge of eutrophication.

## **E. STABILITY OF THE BAY ECOSYSTEM**

Some have claimed that the ecosystem in San Francisco Bay is in imminent danger of collapse. However, evidence from estuarine ecosystems around the world shows that ecosystem collapse occurs in stages, not all at once [Wheeler, 1979; EPA, 1982; Goldman and Horne, 1983, pp. 407-410]. Any ecosystem on the verge of collapse would already show significant decreases in abundance and diversity of major ecosystem components. There is no evidence of such decreases in San Francisco Bay.

In addition, if pollution levels remain under control in the estuary, the analysis in Appendix 4 indicates that ecological collapse of the estuary is highly unlikely. When local populations of some species decline, corrective mechanisms exist. Nearby estuaries contain populations of many native species that could repopulate the Bay in the event of a decline of the existing Bay population [Ricklefs, 1987]. Declines of introduced species would, in many cases, be beneficial to the Bay. Also, alternative habitats are available within the Bay to accommodate many organisms in the event of changes such as a slow long-term shift in salinity levels.

## **F. NEED FOR BIOLOGICAL CHANGES IN THE BAY**

In Appendix 4, it is also pointed out that, contrary to popular belief, attempts to maintain static conditions will *not* preserve the ecosystem over long periods. This understanding comes both from ecological theory and experience in managing large wildlife parks [various authors, "Conservation 2001", 1986]. The observations necessarily come mostly from terrestrial ecosystems, since the creation of aquatic reserves is more recent and less well monitored. The essence of the concept is that large changes, sometimes involving significant local reductions in populations of some species, are vital for the long-term survival of the whole ecosystem. These changes correct the imbalances likely to develop in the system. Otherwise, some



species can become very dominant, destroy much of the habitat for most other organisms and create an ecosystem very different from the one we thought we were protecting. Under natural conditions, local reductions in populations of some species, followed by immigration at a later date, restores the system to its original state.

It is important to remember that the desired ecosystem [i.e., the one preferred by a majority of humans] may be only one of several possible natural states, some of which we may not like at all [Lewin, 1986]. Recent examples of undesirable consequences of well-meaning management attempts include overgrowth of trees in Yosemite Valley meadows as a result of fire suppression, destruction of acacia groves by elephants in some African game parks, and decimation of California's native cut-throat trout resulting from the introduction of rainbow trout. In all of these case, large changes to reduce the rampant species would be necessary to reset the ecosystem to something like its original condition.

## **6. THE STATUS OF DELTA OUTFLOW**

### **A. DELTA OUTFLOW UNDER UNDISTURBED NATURAL CONDITIONS**

Some have claimed that Delta outflow has been sharply reduced from the outflow expected under undisturbed natural conditions, and suggested that this could lead to disastrous consequences for the San Francisco Bay ecosystem. However, the detailed analysis in Appendix 2 indicates that freshwater inflow to San Francisco Bay from the Delta is presently about the same as it was under natural conditions. Therefore, drainage, reclamation, flood control and water development in the Central Valley have not significantly affected the quantity of freshwater reaching San Francisco Bay as compared to undisturbed natural conditions. Early development in the Valley increased outflows while subsequent development reduced them to about their initial level. Evaporative water losses from the original marshes and riparian forests in the Central Valley exceeded present in-basin use and exports. The monthly distribution of flow into San Francisco Bay was much more uniform under natural conditions than it is presently, and winter and spring pulse flows common today were probably rare under natural conditions.

Originally, the trough of the Central Valley functioned as a reservoir, filling and draining every year. Tule marshes choked these natural reservoirs, and riparian forests lined the stream channels along the Valley floor. This natural vegetation took advantage of the plentiful supply of water, using far more than the irrigated crops that replaced them. When the Central Valley was developed, the natural flood basins were drained, the tule marshes and riparian forest were replaced by irrigated crops, and the upslope forests were harvested. The original languid, slow moving, lake-like environment in the Central Valley was transformed into the highly channelized system with very short hydraulic residence times and high velocities that we know today. The principal result of upstream development has been to

replace Valley reservoirs with man-made upstream reservoir storage, and evaporative water losses by natural vegetation with consumptive use by agricultural crops and humans.

We calculated the freshwater inflow to San Francisco Bay from a water balance around the Sacramento Valley, the Delta and upslope areas, and the San Joaquin Valley. The water balance is:

$$\text{Delta Outflow} = \text{Water Supply} - \text{Water Use by Native Vegetation}$$

The total water supply is equal to the sum of unimpaired rim inflows, Tulare Lake Basin overflow, and precipitation on the valley floor. We assumed that over the long term, the net change in basin storage (groundwater, bank storage, natural flood basins, marshes) is zero.

The results of the water balance for long-term, average annual conditions are presented in Table 5. We used a range for vegetative water use because the consumptive use varied in different parts of the Valley. Under natural conditions, an average of 38.8 million acre feet of water were available each year. From 51 to 80 percent of this supply was consumptively used by native vegetation and the balance entered San Francisco Bay. Slightly more than one-third of the water was evapotranspired by the riparian forests that lined all of the major streams. The balance was used by tule marshes in the natural flood basins and by grasses, primarily *Stipa* spp. and saltgrass, in the expansive plains. The remaining 7.8 to 18.9 million acre feet annually flowed through the Delta into San Francisco Bay.

"Unimpaired" flows calculated by DWR [DWR, 1987], assume present channel configurations, no diversions, or exports, and no tule marsh or riparian forest water use. They assume that the natural flood basins and their marshes have been

TABLE 5

FRESHWATER INFLOW TO SAN FRANCISCO BAY  
CALCULATED FROM A WATER BALANCE AROUND THE CENTRAL VALLEY

Element in Water Balance	Water (1,000 acre-feet/year)
<b>Water Supply</b>	
Unimpaired Rim Inflow	28.2
Tulare Lake Basin Inflow	0.2
Precipitation on Valley Floor	10.5
<b>Total</b>	<b>38.8</b>
<b>Water Use by Native Vegetation</b>	
Riparian Forest	8.6 – 11.5
Tule Marsh	5.7 – 8.5
Prairie	5.6 – 11.0
<b>Total</b>	<b>19.9 – 31.0</b>
Freshwater Inflow to San Francisco Bay under Natural Conditions	7.8 – 18.9

drained, that levees and channel bypasses are in place, and that the Valley water supply and runoff have the same characteristics as foothill areas. Although these unimpaired flows certainly never existed, their magnitude may have been approached sometime between 1850 and 1900.

The results of our analyses are summarized in Figure 2, which shows changes in Delta outflow. We plotted along the bottom of this chart the historic events responsible for the changes. Early development in the Valley increased Delta outflow from 13 million ac-ft/yr (the midpoint of our calculated range) around 1770 to about 28 million ac-ft/yr between 1850 and 1990. The increase occurred primarily because high water-using vegetation (tule marsh and riparian forest) was replaced by lower water-using crops and urban areas. This native vegetation used over 17 million ac-ft/yr of water, more than is presently exported from and used within the Central Valley. The increase in water yield that occurred when native vegetation was removed was subsequently used primarily for agriculture and domestic water supply, returning freshwater inflow to about the amount that naturally reached San Francisco Bay.

## **B. OCCURRENCE OF HIGH DELTA OUTFLOWS**

Occasional high freshwater inflows are probably important in maintaining the estuarine ecosystem of San Francisco Bay, because they lower the salinity and control invasions by marine species that might otherwise take over the estuary. To investigate the incidence of high Delta outflows, DWR [1987] studied historic daily outflow records to determine the number of days that flows exceeded 100,000 cfs, and the duration of each period when flows exceeded 100,000 cfs. The results, presented in Table 6, show that the annual average number of high outflow periods, and the average duration of those high outflow periods, have not changed markedly since 1930.

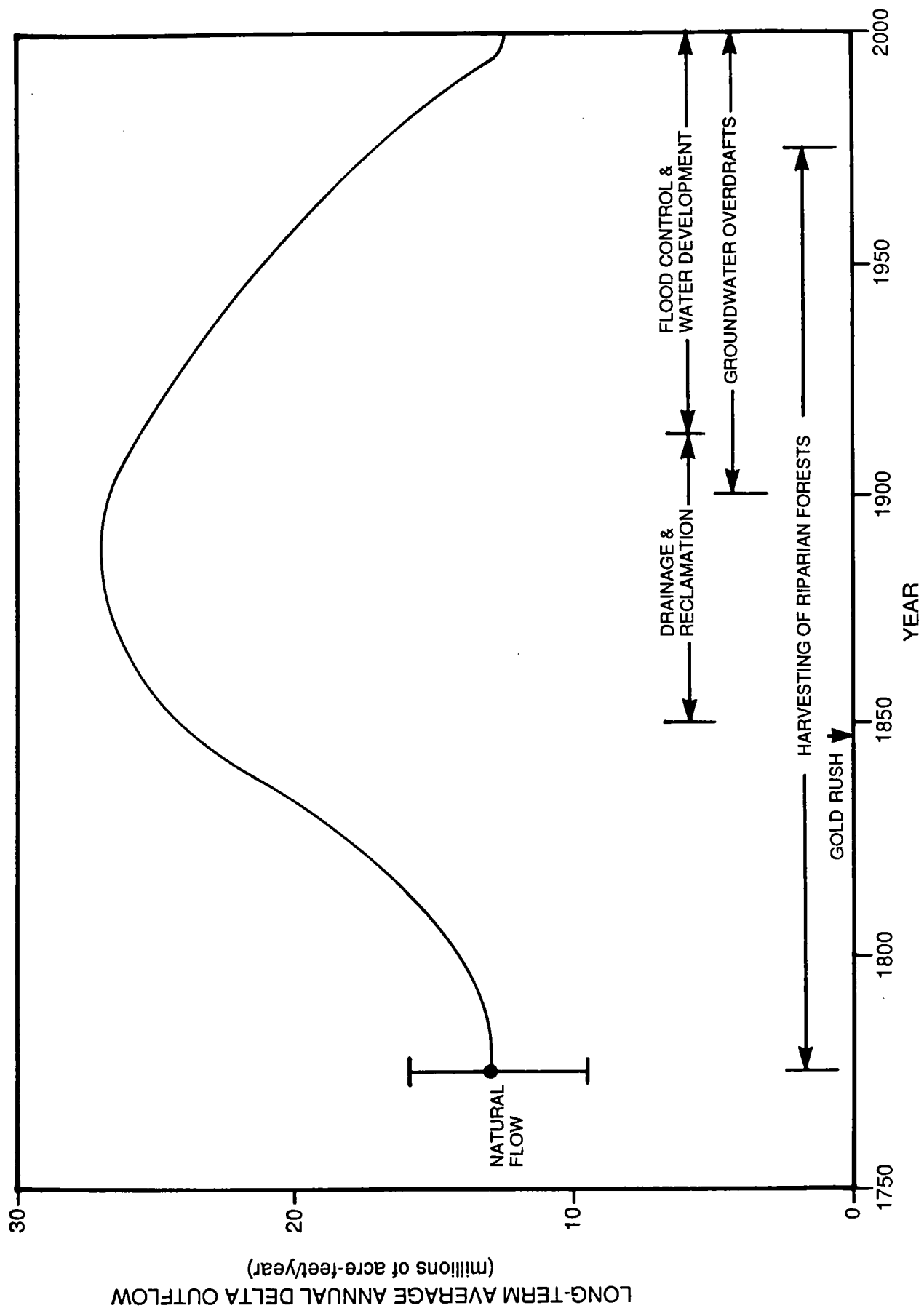


FIGURE 2. Summary of Historic Changes in Delta Outflows.

TABLE 6

NUMBER AND DURATION OF PERIODS WITH  
FLOW EXCEEDING 100,000 CFS AT CHIPPS ISLAND FOR  
WATER YEARS 1930 THROUGH 1986

Period	Number	Avg number/yr	Total days	Avg days/yr	Avg length(days)
1930 – 44 <sup>a</sup>	26	1.7	395	26	15
1945 – 67 <sup>b</sup>	40	1.7	431	19	11
1968 – 86 <sup>c</sup>	36	1.9	507	27	14

<sup>a</sup> 4 wet years, 3 above normal years, 1 below normal year, 3 dry years, 4 critical years.

<sup>b</sup> 8 wet years, 3 above normal years, 7 below normal years, 6 dry years, no critical years.

<sup>c</sup> 11 wet years, 1 above normal year, 2 below normal years, 3 dry years, 3 critical years.

### **C. VARIABILITY IN DELTA OUTFLOW**

Figure 3 shows average monthly Delta outflow, based on data provided by the Department of Water Resources. Flood control/water development projects have decreased average April through May outflows and increased average August and September outflows, particularly after 1960. Overall data and January through March data are highly variable and show no clear trends.



Figure 3. Monthly Delta Outflow.

## **7. SOME LOCALIZED POLLUTION PROBLEMS REMAIN**

Although we found no evidence of Bay-wide problems, it is clear that there are some localized pollution problems in the Bay, primarily in near-shore areas. The existence of these localized pollution problems highlights the need for further controls on pollutant discharges to San Francisco Bay and its tributaries.

### **A. POLLUTION PROBLEMS OCCUR PRIMARILY IN NEAR-SHORE AREAS**

In addition to the open-water monitoring stations discussed previously, the State Mussel Watch program has deployed mussels in near-shore areas to look for suspected areas of localized contamination from sources such as leaking hazardous waste sites, extensive maritime activity and inadequately controlled wastewater discharges. The Mussel Watch data clearly demonstrate that some of the harbor areas and areas near known sources of pollution are experiencing bioaccumulation of contaminants to relatively high levels. This is particularly true of pesticides.

Among those areas showing high levels of synthetic organics in confined channels of harbors and ports, the Santa Fe Channel of Richmond Inner Harbor has some of the highest levels in the state of aldrin, chlordane, DDT and its derivatives, dieldrin, delta-hexachlorocyclohexane and total PCB's. Evidence suggests the old United Heckathorn Company pesticide manufacturing plant may be a major source, particularly for DDT and dieldrin. As distinct from the data collected at open-water stations, the Mussel Watch data collected in confined near-shore areas close to sources of pollutants documents the existence of localized pollution problems in the Bay, and underscores the need for controlling pollutant discharges to the Bay.

Several studies on sediment contamination show that toxic contamination is higher in the Bay margins and tributaries than in deeper areas. The results are:

1. THE U.S. GEOLOGICAL SURVEY FOUND LOWER CONCENTRATIONS OF TRACE METALS IN SEDIMENTS ALONG THE BAY CHANNELS AND SHOALS AND HIGHER CONCENTRATIONS IN THE TRIBUTARIES AND MARGINS.

In 1971 and 1972 the U.S. Geological Survey conducted reconnaissance surveys of the trace metal pollutants mercury, copper and lead in surface sediments in San Francisco Bay. The highest surface sediment concentrations of these elements were found in tributaries and along the Bay margins. Intermediate concentrations occurred in fine silt-clay sediments in shoal areas. The lowest levels were found in the channels, where sand is abundant and currents are strongest [McCulloch et al, 1971; Peterson et al, 1972].

2. CORPS OF ENGINEERS DREDGE STUDIES FOUND SEDIMENT CONTAMINATION IS LOWER IN OPEN-WATER CHANNELS AND HIGHER IN DREDGED CHANNELS LEADING TO HARBORS.

From 1970 through 1974, the Corps of Engineers compared contaminant concentrations in sediment in dredged channels of the North Bay [including Carquinez Strait and Suisun Bay], Central Bay, South Bay and the Main Ship Channel [U.S. Army Corps of Engineers Appendix B, 1979]. Sediments in open-water channels such as Pinole Shoal Channel in North Bay, West Richmond Channel and Southampton Shoal in Central Bay, and San Bruno Shoal in South Bay have lower mean pollutant concentrations than sediments in partially enclosed channels in developed harbors like Redwood City Harbor, Islais Creek, Oakland Harbor and Richmond Harbor.

3. STUDIES OF SOUTH SAN FRANCISCO BAY SHOW SEDIMENT CONTAMINATION IS HIGHER CLOSE TO SHORE.

Bradford and Luoma [1980] and Luoma and Cloern [1982] documented the distribution of trace metals in clams and sediments along the shores of the South Bay. The highest levels were found near shore and near the discharge points, especially near wastewater treatment plant outfalls.

The South Bay Dischargers Association conducted a five-year study of contaminants in the water column and sediments in the South Bay [Kinnetic Laboratories, Inc. and Larry Walker Associates, Inc. 1987]. Over the period of the study, water concentrations of trace metals showed some variations, but sediment concentrations stayed fairly constant. Spatial trends in the distribution of trace metals throughout the study area were apparent for copper, nickel, zinc, and mercury. Each of these elements decreased in concentration with increasing distance from Coyote Creek, which receives wastewater discharges from the San Jose/Santa Clara municipal treatment plant.

The following conclusions emerge regarding near-shore pollution problems:

- Near-shore areas are expected to have higher levels of contaminants than areas distant from shore, because near-shore areas receive deposits of fine particulate matter with a high affinity for pollutants.
- Pollutant inputs to confined near-shore areas such as marinas and harbors are likely to create localized pollution problems [e.g. tributyltin in harbor areas, oil contamination at Castro Cove and DDT residues in Richmond Inner Harbor].
- Potential exposure to toxic pollutants is higher for near-shore benthic organisms such as clams and worms because they are near the sources, and there are higher concentrations of pollutants in near-shore sediments.

- Pollutants discharged into the deeper open waters of the Bay [e.g., chemical spills from vessels, or discharges from offshore outfalls] dissipate more quickly than those discharged near shore, because currents are stronger and there is more dilution offshore.

These conclusions indicate the need for further control of toxic discharges to near-shore areas of the Bay because near-shore sediments can trap pollutants and act as reservoirs of toxic materials for a long time.

## **B. THE CHEVRON REFINERY EIR PROVIDES AN EXAMPLE OF SIGNIFICANT LOCAL EFFECTS RESULTING FROM INADEQUATELY TREATED WASTEWATER DISCHARGES.**

Most of the widely reported effects of toxic pollutants on biota in the Bay result from specific point-source discharges. The Chevron refinery constitutes an important case study of this kind of effect. An environmental impact report on the proposed Chevron outfall relocation project was completed in March 1987 [Jefferson Associates, 1987]. The EIR was prepared for a project to construct a deep-water outfall for the discharge of the Chevron refinery's treated process wastewater. The 53.2 mgd now discharged from the refinery to Castro Cove includes about 40 mgd of non-contact cooling water and about 13 mgd of process wastewater. The new outfall would discharge the 13 mgd of process wastewater to the Bay at Point San Pablo. The non-contact cooling water would still be discharged to Castro Cove via the existing outfall. The EIR indicates that:

- Many striped bass in Castro Cove where the refinery effluent is now discharged have almost completely lost their fins. The deformed striped bass found in Castro Cove were only 1.5 to 3 inches long. Subsequent laboratory tests showed that fin erosion was caused by extended exposure to effluent even at dilutions of as much as ten to one.

- Dungeness crab in Castro Cove had missing limbs and blackened areas on their shells. The cause of the discoloration could not be identified.
- Petrochemicals, petroleum hydrocarbons and aromatic hydrocarbons from refinery discharges can enter the food chain through accumulation in shellfish.
- Based on bioassays, the California Department of Fish and Game predicted 50% mortality of sanddabs exposed for 25 days to the pollutant levels observed in Castro Cove.
- Laboratory tests on striped bass and steelhead trout indicated that migratory fish would NOT be affected by the effluent discharged by the proposed outfall through avoidance of, or attraction to, the area.

The Chevron EIR provides a specific example of the local effects that can be caused by pollutant discharges to the Bay.

## **C. SPECIFIC POLLUTION PROBLEMS**

PCBs [polychlorinated biphenyls], and butyltin have drawn attention as pollutants of concern in the Bay. Available data on these problems indicate the following:

### **1. PCB Pollution**

Testimony by the Aquatic Habitat Institute indicates that San Francisco Bay has elevated levels of PCBs [Phillips, 1987], and that the major sources of PCBs are urban runoff, chemical spills and atmospheric deposition [Gunther et al, 1987].

There are indications in the Mussel Watch data of higher PCB levels in 1981, possibly indicative of a significant spill, with subsequently declining levels. The

State Water Resources Control Board's Toxic Substances Monitoring Program also found high levels of PCBs in fish from the South Fork of the Feather River in 1980. These were later traced to a spill and pollution from powerhouse sumps that could have had an indirect influence on San Francisco Bay. Another significant local source of PCBs is the General Electric transformer fabricating site in Oakland [Ghirelli et al, 1983]. The General Electric facility used a PCB-containing mixture for filling transformers during 30 years of transformer production ending in 1975. Until the early 1950s, waste oils were routinely buried at the site. PCBs in soils at the site were found at levels as high as 5,500 ppm, with concentrations at 35 feet of depth as high as 210 ppm and at 40 feet of 1 ppm. Saline groundwater under the site may have contributed PCBs to the Bay, as did storm runoff. Peak levels of PCB in sediments have declined over the past decade in the Central Bay. The U.S. Army Corps of Engineers reported levels ranging from 20-120 ppb [dry weight] in 1975 [U.S. Army COE, 1975]. 1984 measurements show dry weight levels of 5-24 ppb [Spies et al, 1985] and 4-61 ppb [NOAA, 1987].

## **2. Butyltin Pollution**

The status of butyltin pollution in San Francisco Bay is reviewed in Appendix 5. These organic tin compounds, used as ingredients in anti-fouling paint, are found at high levels near marinas in the Bay and Delta. The levels exceed the Navy's target ambient tributyltin level of 50 ng/l [below which no adverse effects are assumed to occur] by as much as ten-fold. However, whether these high levels of organic tin compounds have adverse environmental effects is not clear, because of questions about bioavailability, duration of exposure and the extent of the areas where organisms are exposed.

## **D. EFFECTS OF URBAN RUNOFF**

AHI testimony [Gunther et al., 1987, pg. 163] indicates that "Urban stormwater is a significant source of toxicants to the Bay-Delta estuary." There is evidence that sub-lethal effects on starry flounder in San Francisco Bay may be related to pollutants in urban runoff. Previously, a link was established between polycyclic aromatic hydrocarbons [PAHs], probably from urban runoff, and hepatic neoplasia [liver disease] in English sole in Puget Sound [Malins et al, 1984]. Consequently, a preliminary study of toxic organic compounds in sediments and starry flounder livers by Spies et al [1985] compared several sites within San Francisco Bay, including San Pablo Bay, Berkeley, Oakland and Alameda. The incidence and severity of liver lesions in starry flounder were determined at each of the four sites along with concentrations of metals, chlorinated hydrocarbons and PAHs in sediments and fish liver tissues. There were indications of a connection between sediment concentrations of benzo(a)pyrene, a powerful carcinogen found in urban runoff, and liver damage in starry flounders. Furthermore, Spies and Rice [1987] indicate that spawning success in starry flounder in San Francisco Bay is adversely affected by PCBs and PAHs, which are often found in urban runoff.

## **E. SELENIUM IN THE BAY**

Elevated levels of selenium have been found in San Francisco Bay biota, but no biological abnormalities have been noted in conjunction with these selenium levels. Some have claimed that these elevated levels of selenium are the precursor of Bay-wide pollution problems related to agricultural drainage. However, they are more likely to result from Bay Area selenium discharges.

There are large discharges of selenium to San Francisco Bay, particularly from petroleum refineries in the Carquinez Strait area [Cutter, 1987] and Jefferson Associates, (1987)]. On the other hand, because selenium in Delta outflow at Chipps



Island is not elevated above background levels [Brown, (1985) and Cutter, (1987)], selenium inputs to San Francisco Bay from Delta outflow are probably not much different than in the past.

It is generally agreed that the primary sources of elevated selenium levels in South Bay biota are local discharges to the South Bay, and not Delta outflow [Davoren, (1985)].

Elevated levels of selenium in biota in the San Pablo Bay and Carquinez Strait areas probably result from industrial discharges around Carquinez Strait.

Elevated levels of selenium in Suisun Bay biota, upstream of the industrial discharges around Carquinez Strait, are probably largely the result of industrial discharges. If elevated selenium in Suisun Bay biota were caused by Delta outflow, one would expect to see elevated selenium levels in Delta outflow and in Delta biota. Neither of these have been found. The likely mechanism for upstream transport of selenium from industrial discharges around Carquinez Strait to Suisun Bay biota is estuarine circulation, supplemented by tidal currents. Selenium from industrial discharges around Carquinez Strait may be taken up by phytoplankton, some of which settle towards the bottom, and swept upstream to enter the food chain in Suisun Bay by the salt-water underflow characteristic of estuarine circulation.

Because no biological abnormalities have been found in association with the elevated selenium levels in San Francisco Bay, selenium does not appear to be a problem in the Bay.

## **8. HISTORIC CHANGES IN THE BAY.**

Beginning about 1850, San Francisco Bay has been highly modified from its undisturbed natural state [Phillips, 1987, pgs. 307-308]. The growth of a large urban community in the Bay Area was accompanied by extensive filling and dredging of the Bay, the continuing discharge of large volumes of municipal and industrial wastes, over-exploitation of fisheries, and extensive modification of the onshore habitat tributary to the Bay. In addition, hydraulic mining in the Sierra foothills introduced large sediment loads to the Bay, and hundreds of terrestrial and aquatic species have been introduced to the area. The chronology shown in Figure 4 highlights the historical changes that influenced San Francisco Bay. It demonstrates that many of these changes took place well before recent flood control/water development projects began to influence the Bay, or are independent of changes caused by the projects.

As discussed in Appendix 2, there is evidence that Delta outflow prior to the influx of European settlers was substantially LESS than previously believed. The development of agriculture in the Delta and the Central Valley, and the construction of levees, initially led to an increase in average annual Delta outflow above that expected under natural conditions. In other words, reductions in Delta outflow resulting from recent flood control/water development projects have been less than those indicated by earlier analyses, and may have brought Delta outflow back to near its original levels. Furthermore, summer outflows were higher, and winter outflows lower, than suggested by previous analyses developed to represent undisturbed natural conditions.

Figure 4 History of San Francisco Bay.

Miller [1986] points out that filling has reduced the area of tidal marshes in the Bay and Delta by more than 90% since the mid-1800s. Drawing on data from Atwater [1979], Miller estimates that this resulted in a loss of one-third of the Bay-Delta production of organic matter.

The introduction of non-native species has had tremendous effects on the natural ecosystem of San Francisco Bay. For example, striped bass, a popular game fish, are not native to San Francisco Bay. They were introduced to the Bay from the East Coast in the late 1800s. Testimony submitted by the Aquatic Habitat Institute [AHI] indicates that introduced species account for more than 95% of the benthic biomass in some areas of the Bay [Phillips, 1987, pg. 308]. AHI states that the present-day benthos is in no way similar to the original benthic communities, having undergone major changes since the arrival of European settlers. Ecological changes resulting from the introduction of new species are still occurring in the estuary. For example, the yellowfin goby, introduced into the Bay in the 1960s, is now one of the more abundant fish in the Bay.

This information makes it clear that, in dealing with San Francisco Bay, we are managing a highly modified ecosystem, rather than preserving an undisturbed environment in its pristine state.

## **9. INFORMATION FROM ADDITIONAL STUDIES**

Having established that there is no reliable evidence that San Francisco Bay is in poor condition, we studied several phenomena to see if any clear-cut guidance for future actions in the Bay would emerge. The phenomena investigated included:

- salinity
- effects of Delta outflow on the Southern Reach of the Bay.
- persistence of pollutants
- bioavailability of pollutants as affected by freshwater inflow

### **A. SALINITY**

Historical salinity data for seven stations where long-term salinity data has been collected in the San Francisco Bay-Delta system is shown in Figure 5. Delta outflow is also included for comparative purposes. The nearly straight line through each data set is a long-term average. Figure 5 shows that the principal characteristic of salinity in the Bay is its variability, as demonstrated by the large amount of scatter in the data. The natural variability in salinity greatly exceeds the small long-term changes shown by the trend curve.

The detailed analysis of salinity and temperature data reported in Appendix 6 resulted in the following conclusion:

- Changes in both salinity and water temperature resulting from upstream flood control/water development are small compared to changes arising from natural variability. Our analyses of historical salinity and temperature

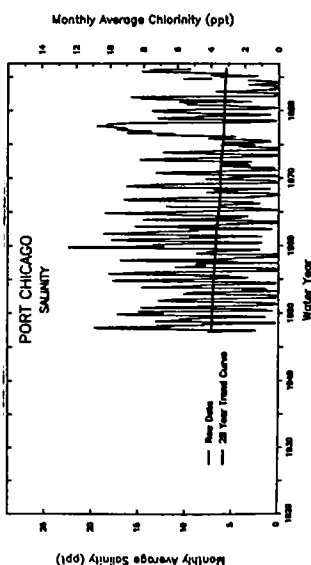
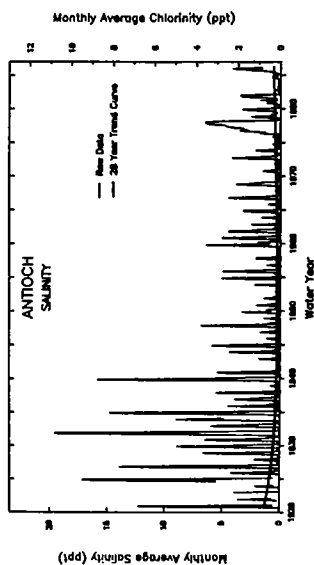
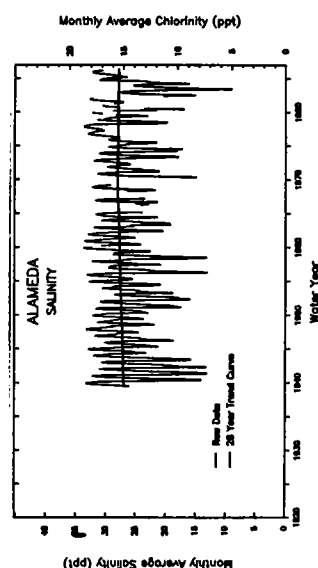
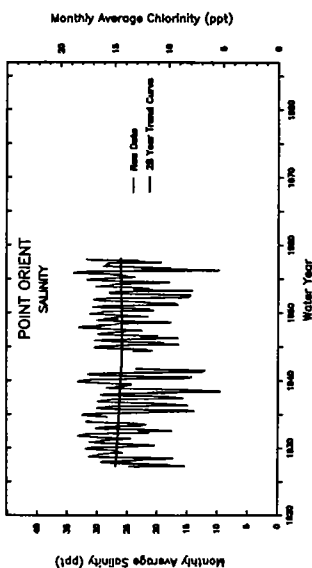
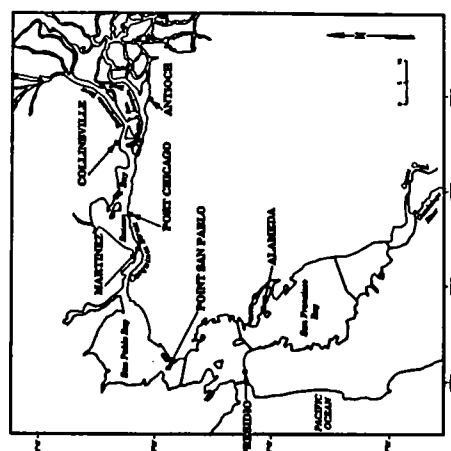
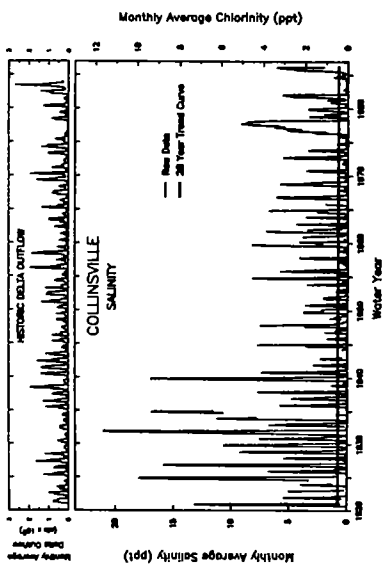


FIGURE 5. Historical Salinity Data at Seven Sites.

data indicate that there has been no significant increase in salinity and temperature since the 1920s anywhere in the Bay except at the Presidio.

- Upstream flood control/water development has significantly decreased summer and fall salinities in the western Delta, while only slightly increasing winter and spring salinities.
- At the Presidio, salinity has increased over the past half century at a rate of about 0.1 percent per year or 34 parts-per-million per year (ppm/yr.) Our analyses suggest that this increase has been caused by changes in off-shore oceanic conditions rather than changes in Delta outflow. Since ocean water has 300 times more salt in it than Delta outflow, minor changes in conditions in the ocean can have a major effect on salinity at the Presidio, and other locations in the Bay.
- Oceanographic research indicates that the high-salinity, northward flowing counter-current in off-shore waters has strengthened, transporting higher salinity water along the California coast. We estimate that this may have increased salinity at the Presidio by as much as 24 ppm/yr. The sea level is also rising at the Golden Gate at a rate of about 0.0005 feet/yr (ft/yr). This has increased the volume of ocean water that enters the Bay. We estimate that this may have increased salinity at the Presidio by at least 10 ppm/yr. Corresponding changes at other stations in the Bay resulting from oceanic factors would be smaller.

These results highlight the importance of considering the influence of off-shore oceanic conditions on the Bay. Analyses of actual, historical data indicate that upstream modifications have not resulted in a statistically significant increase in salinity anywhere in the Bay, while shifts in oceanic currents have produced a significant and measurable increase in salinity at the Presidio. Clearly, changing

conditions at the entrance to the Bay caused by changing ocean conditions have strong effects on the rest of the Bay.

## **B. EFFECTS OF DELTA OUTFLOW ON THE SOUTHERN REACH**

The analysis in Appendix 7 indicates that the Southern Reach is *not* an isolated lagoon that is only "flushed" by Delta outflow. The tides and the winds are the principal factors that move pollutants out of the Southern Reach. However, Delta outflow can accelerate the process in some regions, principally the deep channel north of the San Bruno shoals, during high discharges.

We also found that Delta outflow has little effect on pollutants discharged to the shallow regions in the Southern Reach. Non-point source runoff is the primary remaining pollution problem in the Southern Reach, and these effluents are discharged into shallow areas little influenced by Delta outflow.

The work in Appendix 7 suggests that the "flushing" issue is a semantics problem. Delta outflow, in fact, is the major source of "fresh" water in the South Bay. However, water does not have to be "fresh" to transport pollutants; it only has to be "new," which means that it has never been in the Southern Reach before and that it is free of contaminants. The "new" water can be ocean water, Delta outflow, or tributary inflow, as long as it has never before been in the Southern Reach. The majority of the "new" water in the Southern Reach is ocean water.

On the other hand, Delta outflow does affect the salinity of parts of the South Bay, particularly at high flows. The occasional reductions of salinity that accompany high flows may help to maintain the estuarine ecosystem by controlling marine invaders. As discussed previously in Section 5, the frequency and duration of high Delta outflows has not been altered since 1930.



## **C. PERSISTENCE OF POLLUTANTS**

Many pollutants are persistent in aquatic ecosystems, and not easily removed from sediments or organisms once they enter the ecosystem. This reinforces the need to control pollution by eliminating discharges.

Many organic contaminants, such as DDT, other chlorinated pesticides, PCBs and petroleum hydrocarbons are soluble in fatty tissue. As a result, these substances bioaccumulate rapidly and to high levels in organisms, and in decomposing organic matter in water and sediments. This affinity for fatty tissue or organic matter results in slow metabolism and removal of these contaminants by animals, because fat is maintained for energy storage by the animals. Thus, these chemicals persist in the organisms, are passed on to the animals that feed on the contaminated organisms, and move up the food chain.

Inorganic pollutants, such as heavy metals, also bioaccumulate to various degrees. Many of these elements are trace nutrients essential for life. Perhaps because these elements are generally rare in the environment, organisms seem to have developed the capacity to accumulate them readily, but not the capacity to eliminate them easily. In any case, there is often a narrow range between amounts of essential trace elements needed to sustain life and amounts that are toxic.

Furthermore, as explained in more detail in Appendix 8, many pollutants cycle through the environment. For example, they can (a) be absorbed from the water by organisms low in the food chain [such as phytoplankton and zooplankton]; (b) be concentrated in organisms higher in the food chain; (c) enter the sediments through the death and decay of organisms; (d) re-enter the water by absorption from contaminated sediments; (e) and re-enter the food chain directly through absorption by filter-feeding organisms.

There are two primary reasons why control of toxics in the environment must focus on preventing toxic substances from escaping to the environment in the first place:

- Biological depuration [elimination] is typically a much slower process than uptake.
- Pollutants with a high affinity for sediments are generally desorbed slowly.

The result is that, once these pollutants get into organisms or sediments, they are very hard to remove.

#### **D. THE BIOAVAILABILITY OF HEAVY METALS INCREASES WITH INCREASED FRESHWATER DISCHARGE TO THE BAY.**

As discussed in Appendix 9, U.S. Geological Survey results, confirmed by other studies, demonstrate that increases in trace metal loadings, and metal concentrations in North Bay biota and sediments, occur during periods of high Delta outflow. However, the connection between trace-metal concentrations in South Bay organisms and Delta outflow is less clear.

#### **E. RECOMMENDATIONS FOR FUTURE STUDIES**

Continued study will be necessary as we strive to understand, maintain and enhance conditions in San Francisco Bay. Based on this theme, three major areas of investigation are important:

- To improve our understanding of how the Bay's ecology works, studies should be undertaken to quantify the effects of changes in oceanic conditions on the Bay ecosystem.

- To provide guidance for maintaining the estuarine ecosystem of San Francisco Bay in good condition, studies should be performed to determine how occasional salinity decreases control invasions by marine organisms.
- To enhance conditions in the Bay by removing localized near-shore pollution problems, a priority list of pollution sources to San Francisco Bay and its tributaries should be prepared to guide future pollution control efforts.

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**From:** Miller BJ

**Sent:** Friday, June 15, 2012 10:10 AM

**To:** Jason Peltier

**CC:** T Birmingham; Allison Dvorak Febbo; Azhderian Ara; B Walthall; Burman Brenda; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Schulz Cliff; Creel Curtis; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; mizuno@sldmwa. org; Gayle Holman; Greg Zlotnick; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Simonek Laura; LLoyd Fryer; Martin McIntyre; Mike Henry; Mike Wade; Neudeck Randall; Philp,Thomas S; Larry Rodriguez; Patterson Roger; Rose Schlueter; Sheehan,Rebecca D; Greene Sheila; Steve Arakawa; Sue Ramos; Terry Erlewine; Boardman Tom; Tom Glover; Mongan Tom; Valerie Connor; Weiland Paul; Murphy Dennis, gmail; Murphy Dennis, home

**Subject:** Re: PPIC Report on fish stressors

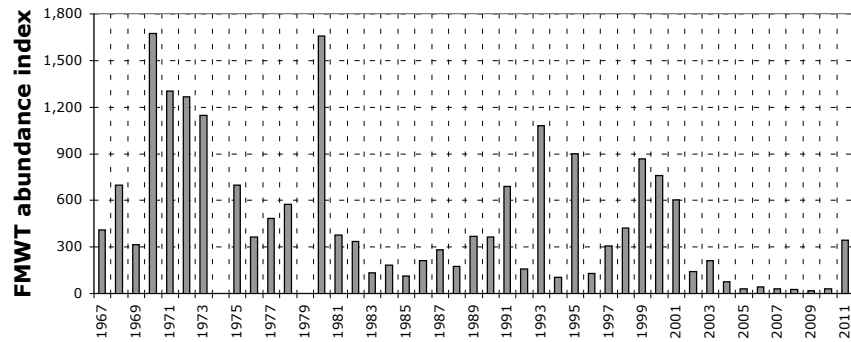
**Attachments:** pelagic fish trends.pdf; Untitled attachment 25001.htm; predator time trends.pdf; Untitled attachment 25004.htm

You don't have to go far into this report to find major errors. Here is the first sentence in the Summary:

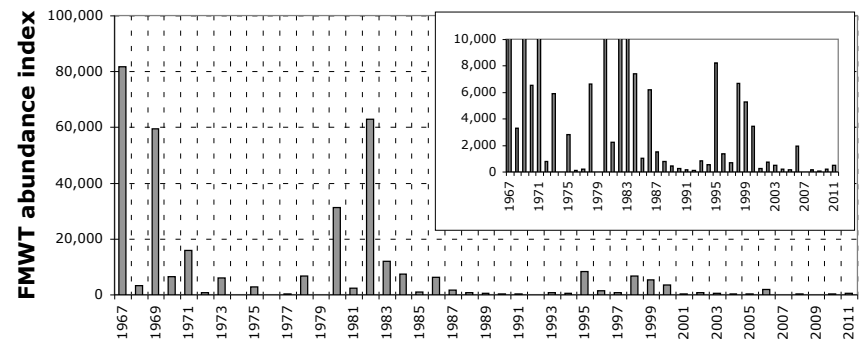
"The native fishes of the Sacramento–San Joaquin Delta have been declining at an increasingly rapid rate for more than two decades."

And here are the abundance trends since 1991, two decades ago. The only species that this statement applies to is maybe striped bass juveniles, and adult stripers have shown no such decline.

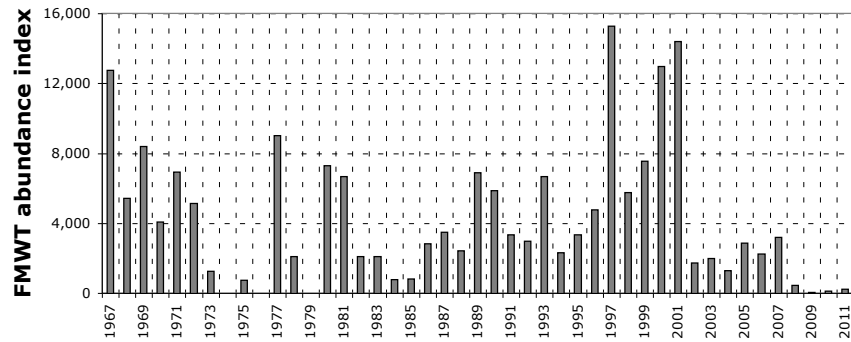
### delta smelt



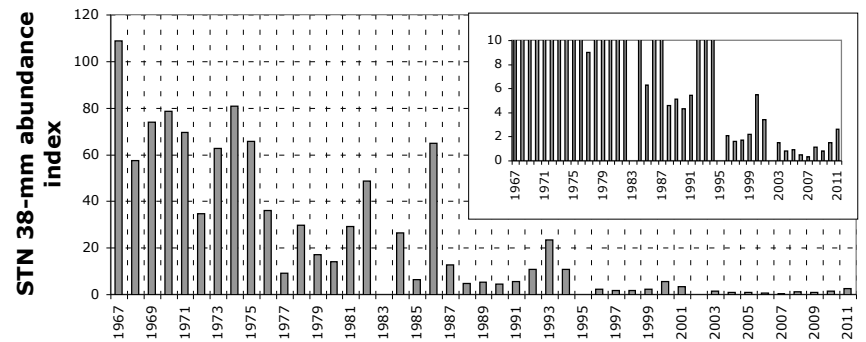
### longfin smelt



### threadfin shad

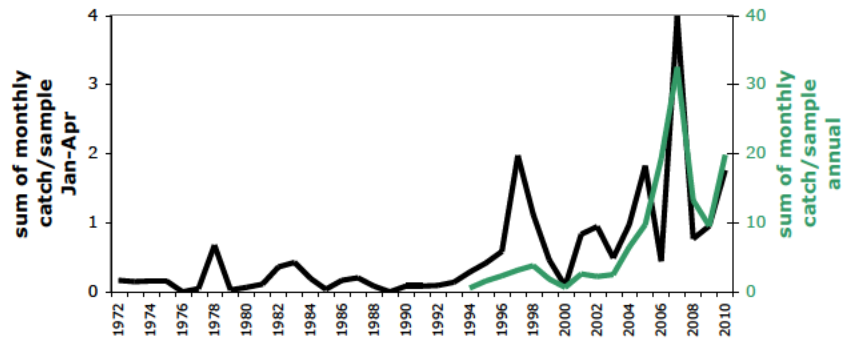


### 38-mm striped bass

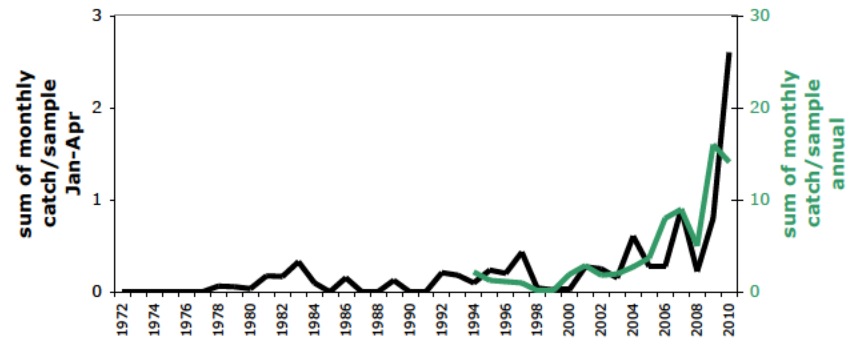


Two sentences later: "There is no single cause for the decline of these fishes." I know this the the IEP Management Team's version of what happened, but that hypothesis (stated as a hypothesis, treated as a conclusion) arose from the failure of the \$500,000 NCEAS analyses to identify the cause of the POD, and that failure resulted from mis-specification of the food variables. If you don't think there was a single cause, check these graphs, showing abundance trends for predaceous fish.

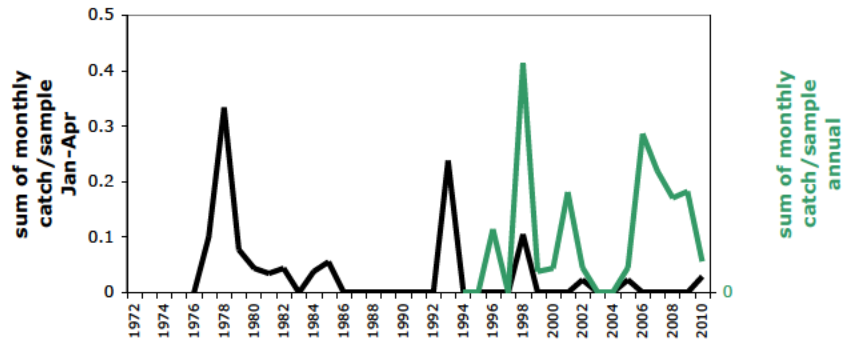
**Lepomis (sunfish)**



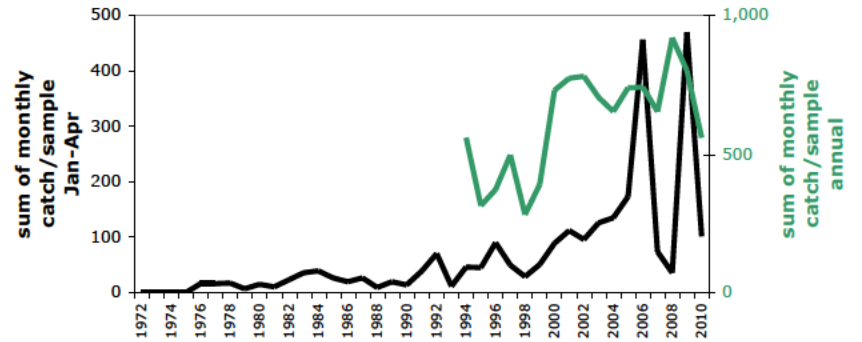
**Largemouth bass**



**Pomoxis (crappie)**



**Mississippi silverside**



Note that, with the exception of Pomoxis (crappie), abundance of these fish sharply increased at the same time the abundance of the pelagics, above, began their sharp decline. If there is no single cause, then, there was a hell of a coincidence of multiple factors.

I think there is a really good chance that this entire "multiple factors" paradigm (which is just another way of saying that we really don't know what happened) simply results from the failure to look hard enough for the single factor or very few factors. Glibert says the common factor explaining the graphs above is nutrient changes, which have been great over the same period.

The data suggest not multiple factors but, rather, for the pelagics, food supply and, maybe, predation (how could you omit it given the above graphs?) and for salmon, ocean conditions and predation (now apparently near 100% for San Joaquin outmigrants) with major effects of harvest if not well-controlled.

Note that implicit in the multiple factor paradigm is the idea that restoring "natural" conditions is the path to recovery, as in, "Many changes have occurred and the more of them we can undo, the more likely it is that the pelagic fish abundance will increase." No statistical correlations or other quantitative analyses are required. This is management by belief in a data-rich estuary.

BJ

On Jun 15, 2012, at 8:49 AM, Jason Peltier wrote:

<http://www.ppic.org/main/publication.asp?i=1024>

## **Aquatic Ecosystem Stressors in the Sacramento-San Joaquin Delta**

Jeffrey Mount, William Bennett, John Durand, William Fleenor, Ellen Hanak, Jay Lund, and Peter Moyle

June 2012

<image008.png>

<image009.jpg> [<image011.png>Full Report](#)

<image010.png> [PDF, 302K]

This report looks at five broad categories of stressors on the Delta's native fishes, examining causes of stress, allocations of responsibility, and options for management.

This research was supported with funding from the **S.D. Bechtel, Jr. Foundation**.

**From:** Byron Buck

**Sent:** Monday, June 18, 2012 7:56 AM

**To:** Miller BJ; Jason Peltier

**CC:** T Birmingham; Allison Dvorak Febbo; Azhderian Ara; B Walthall; Burman Brenda; Carolyn Jensen; Chris Beale; Clare Foley; Schulz Cliff; Creel Curtis; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; mizuno@sldmwa. org; Gayle Holman; Greg Zlotnick; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Simonek Laura; LLOYD Fryer; Martin McIntyre; Mike Henry; Mike Wade; Neudeck Randall; Philp,Thomas S; Larry Rodriguez; Patterson Roger; Rose Schlueter; Sheehan,Rebecca D; Greene Sheila; Steve Arakawa; Sue Ramos; Terry Erlewine; Boardman Tom; Tom Glover; Mongan Tom; Valerie Connor; Weiland Paul; Murphy Dennis, gmail; Murphy Dennis, home

**Subject:** RE: PPIC Report on fish stressors

BJ, it looks largely true for the three others on you chart, Threadfin, Smelt and Longfin, at least on a long term regression. Am I missing something?

Byron Buck

Executive Director

State and Federal Contractors Water Agency

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Sacramento, CA 95811

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**From:** Miller BJ [mailto:bjmiller41@gmail.com]

**Sent:** Friday, June 15, 2012 10:10 AM

**To:** Jason Peltier

**Cc:** T Birmingham; Allison Dvorak Febbo; Azhderian Ara; B Walthall; Burman Brenda; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Schulz Cliff; Creel Curtis; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; mizuno@sldmwa. org; Gayle Holman; Greg Zlotnick; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Simonek Laura; LLOYD Fryer; Martin McIntyre; Mike Henry; Mike Wade; Neudeck Randall; Philp,Thomas S; Larry Rodriguez; Patterson Roger; Rose Schlueter; Sheehan,Rebecca D; Greene Sheila; Steve Arakawa; Sue Ramos; Terry Erlewine; Boardman Tom; Tom Glover; Mongan Tom; Valerie Connor; Weiland Paul; Murphy Dennis, gmail; Murphy Dennis, home

**Subject:** Re: PPIC Report on fish stressors

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"The native fishes of the Sacramento–San Joaquin Delta have been declining at an increasingly rapid rate for more than two decades."

And here are the abundance trends since 1991, two decades ago. The only species that this statement applies to is maybe striped bass juveniles, and adult stripers have shown no such decline.

**From:** Miller BJ

**Sent:** Monday, June 18, 2012 11:55 AM

**To:** Byron Buck

**CC:** Jason Peltier; T Birmingham; Allison Dvorak Febbo; Azhderian Ara; B Walthall; Burman Brenda; Carolyn Jensen; Chris Beale; Clare Foley; Schulz Cliff; Creel Curtis; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; mizuno@sldmwa. org; Gayle Holman; Greg Zlotnick; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Simonek Laura; LLoyd Fryer; Martin McIntyre; Mike Henry; Mike Wade; Neudeck Randall; Philp,Thomas S; Larry Rodriguez; Patterson Roger; Rose Schlueter; Sheehan,Rebecca D; Greene Sheila; Steve Arakawa; Sue Ramos; Terry Erlewine; Boardman Tom; Tom Glover; Mongan Tom; Valerie Connor; Weiland Paul; Murphy Dennis, gmail; Murphy Dennis, home

**Subject:** Re: PPIC Report on fish stressors

**Attachments:** pelagic fish trends.pdf; Untitled attachment 48654.htm

PPIC said the fish have been declining at an increasingly rapid rate for more than two decades, say from about 1987. That is not what the graphs show. The graphs show increases in abundance to relatively high levels from 1987 until about the turn of the century, then a sharp drop in abundance in this century.

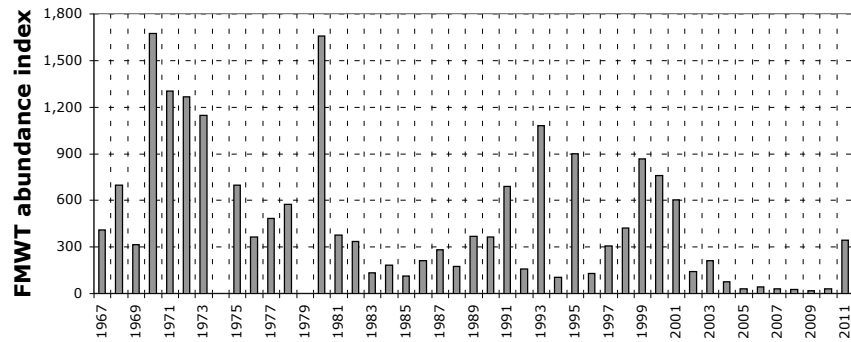
I think this is an important point. It says that these fish were not doing badly just before the POD. Granted, there were some years of higher abundance many years ago for the two smelt and generally higher abundance many years ago for juvenile stripers, but the period just before the POD was very good for threadfin.

PPIC and the IEP Management Team characterizes the trends as a long term collapse, and, based on that characterization, hypothesizes the "multiple factors acting over the decades to reach a tipping point that caused the POD."

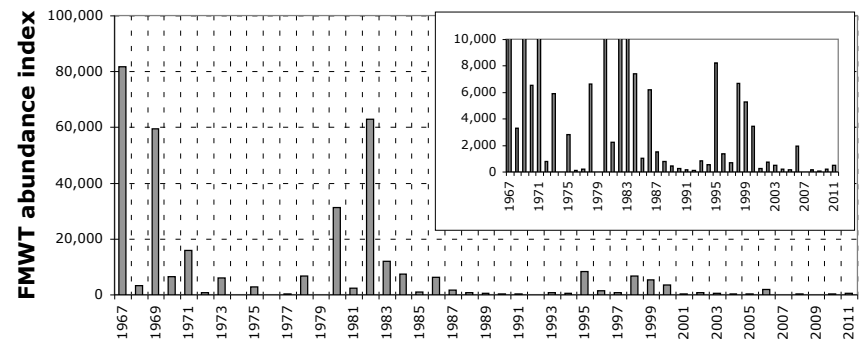
The data show that abundance was, just before the POD, generally at levels that, although lower than many decades ago, would not have caused concern had they persisted, the exception being juvenile striped bass.

BJ

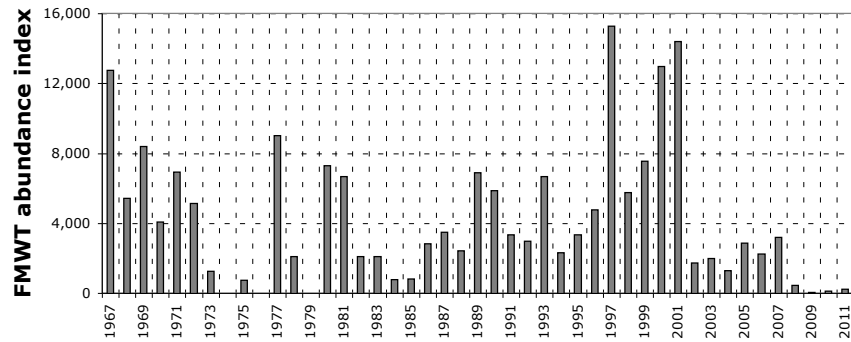
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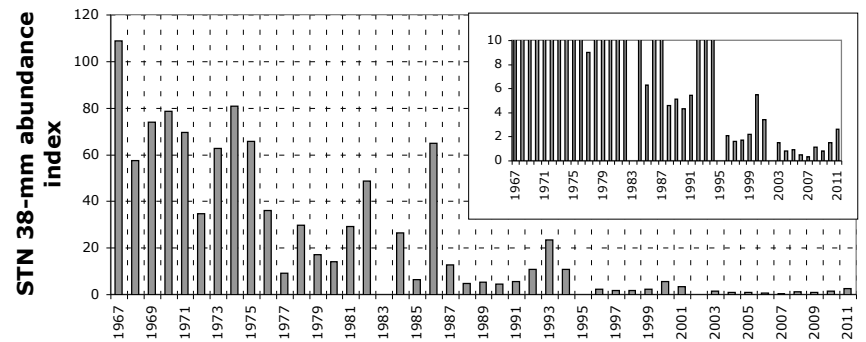
### longfin smelt



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### 38-mm striped bass





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Byron Buck  
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**From:** Miller BJ [mailto:bjmiller41@gmail.com]

**Sent:** Friday, June 15, 2012 10:10 AM

**To:** Jason Peltier

**Cc:** T Birmingham; Allison Dvorak Febbo; Azhderian Ara; B Walthall; Burman Brenda; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Schulz Cliff; Creel Curtis; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; mizuno@sldmwa. org; Gayle Holman; Greg Zlotnick; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Simonek Laura; LLoyd Fryer; Martin McIntyre; Mike Henry; Mike Wade; Neudeck Randall; Philp,Thomas S; Larry Rodriguez; Patterson Roger; Rose Schlueter; Sheehan,Rebecca D; Greene Sheila; Steve Arakawa; Sue Ramos; Terry Erlewine; Boardman Tom; Tom Glover; Mongan Tom; Valerie Connor; Weiland Paul; Murphy Dennis, gmail; Murphy Dennis, home

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**From:** Jason Peltier

**Sent:** Friday, June 22, 2012 10:17 AM

**To:** 'Karen Clark'; 'Tony Coelho'; 'Carmela McHenry'; 'Carolyn Jensen'; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Joe Findaro'; 'Mike Burns'; 'Susan Ramos'; T Birmingham

**Subject:** Economic reports with links and coverage...

Here is the link to the public meeting presentation from earlier this week, worth a look. The bulk of it is David Sunding's economic report presentation [note report is not yet complete.]

[http://baydeltaconservationplan.com/Libraries/Dynamic Document Library/June 2012 Public Meeting Presentation 6-20-12.sflb.ashx](http://baydeltaconservationplan.com/Libraries/Dynamic_Document_Library/June_2012_Public_Meeting_Presentation_6-20-12.sflb.ashx)

Also, here is a link to the UOP economic report:

[http://forecast.pacific.edu/articles/BenefitCostDeltaTunnel\\_Web.pdf](http://forecast.pacific.edu/articles/BenefitCostDeltaTunnel_Web.pdf)

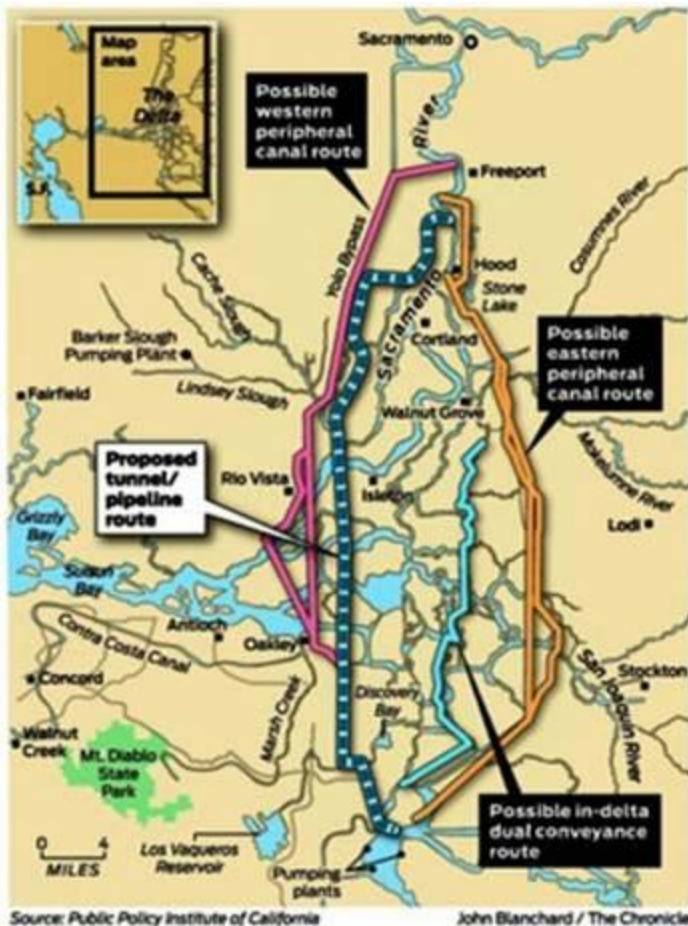
## UOP study: Delta tunnel costs are 2.5 times the benefits

Posted by danbacher on @ 9:16 am

Article printed from speakeasy: <http://blogs.alternet.org/danbacher>

URL to article: <http://blogs.alternet.org/danbacher/2012/06/18/uop-study-delta-tunnel-costs-are-2-5-times-the-benefits/>

"We find the tunnel is not economically justified, because the costs of the tunnel are 2.5 times larger than its benefits," according to the report. "Benefit-cost analysis is an essential and normal part of assessment and planning of large infrastructure projects such as the \$13 billion water conveyance tunnel proposal, but has not been part of the BDCP."



restore\_the\_delta\_media\_b...

UOP study: Delta tunnel costs are 2.5 times the benefits

by Dan Bacher

The California Legislature recently failed to pass legislation requiring a cost-benefit analysis before the peripheral canal or tunnel is built – and it is no surprise why the bill garnered so much opposition from corporate agribusiness and southern California water agencies.

The first comprehensive economic benefit-cost analysis of the water conveyance tunnels at the center of the Bay Delta Conservation Plan (BDCP), conducted by the University of Pacific's Eberhardt School of Business, Business Forecasting Center, reveals that peripheral canal doesn't make any economic or financial sense.

The UOP report states, "We find the tunnel is not economically justified, because the costs of the tunnel are 2.5 times larger than its benefits. Benefit-cost analysis is an essential and normal part of assessment and planning of large infrastructure projects such as the \$13 billion water conveyance tunnel proposal, but has not been part of the BDCP."

Apparently, the members of the Assembly Appropriations Committee, who rejected Assemblymember Bill Berryhill's bill calling for an independent cost-benefit analysis of the tunnel project, were afraid of a similar result if the bill, AB 2421, had ever become law.

“This report fills an important information gap for policy makers and water ratepayers who will ultimately bear the multi-billion costs of the project. The results can be easily updated if changing plans generate updated estimates of benefits and costs, but the gap between benefits and costs is so large that it seems unlikely that the tunnels could be economically justified in any future scenario,” according to the study.

The study examined the benefits, including export water supply, earthquake risk reduction, export water quality benefits and environmental benefits, and compared them to the costs, including capital costs, operating and maintenance costs and in-Delta and upstream costs.

“We find a benefit-cost ratio of 0.4, meaning that there is \$2.50 of costs for every \$1 in economic benefits. When these very low benefit-cost ratios are considered alongside the inconsistent and incomplete financial plans, it is clear that the Delta water conveyance tunnel proposed in the draft BDCP is not justified on an economic or financial basis,” the report concludes.

#### *More water for corporate agribusiness, less water for family farms*

The report notes that the proposed “conveyance” is primarily an agricultural water supply project, since farms use twice as much Delta water as cities do.

“If costs are allocated on a per capita basis, Metropolitan Water District ratepayers would be responsible for 75% of the project costs (they are 18 million of the 25 million people who receive some Delta water), not the 25% that is proportional to the water they use,” the report said. “The use of financial feasibility analysis that allocates the full cost of the project on a per capita basis implies that urban ratepayers will be asked to pay large subsidies for agricultural water supplies in their bills.”

Ironically, while the Brown and Obama administrations and corporate agribusiness have constantly touted “improved conveyance” as the “solution” to providing “reliability” to agriculture in California, the project’s construction would likely do the very opposite to Delta agriculture, according to the study.

“The Delta Protection Commission Economic Sustainability Plan estimated a water conveyance tunnel would result in an average of \$65 million in annual losses for Delta agriculture; including about \$50 million in losses from reduced water quality, and an additional \$15 million in annual crop losses from roughly 8,000 acres of farmland lost to construction impacts and the physical footprint of the facilities,” the document reveals.

In essence, the water conveyance tunnel would take large tracts of the most fertile land in California, the Delta, out of agricultural production in order to divert massive quantities of Delta water to irrigate subsidized crops on drainage-impaired, toxin-laced land on the west side of the San Joaquin Valley.

Dr. Jeffrey Michael, Director of the Business Forecasting Center (BFC) at the University of the Pacific, is the report's primary author. To read the full report, go to: [http://forecast.pacific.edu/articles/BenefitCostDeltaTunnel\\_Web.pdf](http://forecast.pacific.edu/articles/BenefitCostDeltaTunnel_Web.pdf)

So not only does the peripheral canal or tunnel pose an enormous threat to the Bay-Delta ecosystem, but it is not economically or financially feasible, according to this groundbreaking report. The taxpayers and ratepayers will foot the bill for the tunnel – at costs 2.5 times the benefits – while billionaire agribusiness tycoon Stewart Resnick, the Westlands Water District and other subsidized corporate agribusiness interests will profit.

"The common people will pay for the canal and a few people will make millions," said Caleen Sisk, Chief and Spiritual Leader of the Winnemem Wintu Tribe. "It will turn a once pristine water way into a sewer pipe. It will be all bad for the fish, the ocean and the people of California."

The peripheral canal or tunnel, if built, would hasten the extinction of Central Valley chinook salmon, steelhead, Delta smelt, longfin smelt and other fish species, according to both agency and independent scientists. This project, now being fast-tracked by Brown and Obama administrations, would result in the destruction of the largest estuary on the West Coast of the Americas.

#### *Opposition to conveyance tunnel builds momentum*

Opposition against the environmentally destructive and economically unfeasible conveyance project continues to mushroom. On the day before the UOP report was published, Restore the Delta released a powerfully-worded letter from 38 environmental, fishing, consumer, Native American and other groups alerting U.S. Interior Secretary Ken Salazar of the enormous environmental and economic perils posed by the Obama administration's support of the peripheral canal.

The groups said the administration is "poised to make an enormous mistake...and potentially drag the American people along with it," by backing "construction of a world-record-size tunnel or pipes capable of diverting 15,000 cubic feet per second from the Sacramento River – nearly all of its average freshwater flow."

"The planning for California's water future must return to a lawful, science-based, inclusive, and transparent process," the letter stated. "The San Francisco Bay-Delta Estuary must not be stripped of the freshwater flows upon which so many vital public trust resources and West Coast communities depend. From its inception, this plan has been crafted by, and for, South-of-Delta exporters. They have used their economic power to influence and rush this half-baked, multi-billion dollar water tunnel."

The broad coalition sounded the alarm after the Brown administration informed them that the State intends to proceed with construction of a peripheral canal or tunnel that the groups say "would have devastating ecological impacts."

Organizations signing the letter include the Sierra Club California, Environmental Water Caucus, Friends of the River, California Water Impact Network, Winnemem Wintu Tribe, Golden Gate Salmon Association, California Sportfishing

Protection Alliance, Center for Biological Diversity, Food and Water Watch, Pacific Coast Federation of Fishermen's Associations, the Planning and Conservation League, the Environmental Justice Coalition for Water and dozens of other groups.

"The idea that you're going to commit to building a \$50 billion tunnel around the Delta that current science demonstrates won't protect the estuary, and only later revise the science, develop assurances and decide how to operate it simply doesn't pass the smell test," said Bill Jennings, Executive Director/Chairman of the California Sportfishing Protection Alliance, Board Member of the California Water Impact Network and Executive Committee Member of Restore the Delta. "You can bathe this pig in perfume and apply lipstick, but it still won't fly."

The complete letter is posted here: <http://www.restorethedelta.org>

The big question is: If the peripheral canal/tunnel plan is economically, financially and scientifically unfeasible, then why are Governor Jerry Brown, Natural Resources Secretary John Laird and U.S. Interior Secretary Ken Salazar still committed to this boondoggle?

Here is an article from the Stockton Record on the two reports:

# Reports offer very different takes on Delta tunnel

By Alex Breitler

Record Staff Writer

June 22, 2012 12:00 AM

An economist said this week that building a giant tunnel beneath the Delta would be worth the immense cost for water users.

But his announcement came only a few days after another economist said the \$13 billion project is a loser for the state of California as a whole - and by a margin that isn't even close.

While they agree on much of the data, the experts come to very different conclusions. Why? The first study was narrowly focused on the urban and agricultural water agencies, while the second encompassed broader aspects of the huge tunnel plan - including the ramifications for farmers west of Stockton if a portion of the Sacramento River is diverted upstream of the estuary.

Debate over the cost of the project has intensified, with Gov. Jerry Brown expected to announce the specifics of a plan by the end of July.

Delta advocates have called repeatedly for a broad cost-benefit study before any decision is made.

The state has declined to conduct such a study. It did hire economist David Sunding - a professor at the University of California, Berkeley, and a principal with the global consulting firm The Brattle Group - to study the benefits of the project specifically for the cities and farms that would receive Delta water through the new tunnel.

Sunding discussed his ongoing study at a meeting Wednesday updating the public on the tunnel plan, formally known as the Bay Delta Conservation Plan. The point of the study, he said, is to find out if the benefits are large enough to make the project worthwhile.

"If it's not worth paying for, we might as well stop pretty soon," he said.

But that's not what Sunding found so far.

"I think it's really beyond serious debate at this point that the benefits of BDCP to the agencies ... exceed the cost," he said.

Sunding identified billions of dollars in benefits from improved water supply, water quality and the reduction in risk of an earthquake toppling Delta levees if a tunnel is built to bypass those waterways.

But, as he made clear on Wednesday, he was not asked to do a full statewide analysis of all the costs and benefits.

University of the Pacific economist Jeff Michael took a stab at that task. In a paper released late last week, Michael found that when you consider the cost to build the tunnel and operate and maintain it, along with the harm done to Delta agriculture and other impacts not considered by Sunding, the cost of the tunnel is 2.5 times greater than the benefits it would provide.

Michael said he's been pushing for a full study for several years.

"I'd prefer for someone else to do (the analysis), but it's a critical thing, and we can't make the question go away by not looking at it," Michael said Thursday. "It's good to get it out there. I think it has moved the discussion."

Michael has worked as a consultant for the locally leaning Delta Protection Commission, which calls for strengthening Delta levees instead of building a new aqueduct. But he said this work was done on his own.

Michael said he and Sunding appeared to come to similar findings about the economic benefits from water supply and improved water quality.

But Sunding also reported \$11.6 billion in expected benefits for the water users through what are known as "regulatory assurances" - and that is where the two economists part ways.

Under federal law, the Bay Delta Conservation Plan would grant long-term permits for water users to take Delta water, in exchange for investing billions into replumbing the Delta. If such an agreement can be secured, the idea is that the water users would be safeguarded from future regulations that could further constrain their supply.

Sunding quantified those assurances as part of his study, a big reason he was able to come to his conclusion that the tunnel is a good bet for the water agencies.

There is some question, however, to what degree these assurances will exist for Delta water users. What happens if a tunnel is built and habitat restored, but the environment of the Delta continues to decline? Some believe the water users may be subject to further regulation, throwing into question the \$11.6 billion benefit on which Sunding bases part of his conclusion that the tunnel is affordable.

"It's clear from his math that the economics of the (tunnel) from his analysis completely depends upon this regulatory assurance," Michael said Thursday. "That's the fundamental difference between his conclusion and my conclusion. It's a concept that, like I said, is certainly debatable."

Sunding said at Wednesday's meeting that he plans to sit down with Michael, "go through this and figure out where we agree and where we're coming from different perspectives."

Advocates at the meeting weren't pleased with his presentation.

"I'm very disturbed by what I heard," Dick Pool, a fish advocate and gear distributor based in Concord, told California Deputy Resources Secretary Jerry Meral. "You work for the state, You don't work for these water contractors. You need to get some economists that will really do a statewide (analysis)."

Meral said future study could include a look at the impact to Delta agriculture.

"This isn't the end," he said. "It's another step. I was particularly impressed when I read the two (economists') reports, how close they were, relatively speaking."



**From:** Karen Clark

**Sent:** Tuesday, June 26, 2012 7:53 AM

**To:** 'Alison MacLeod'; 'Carmela McHenry'; 'Carolyn Jensen'; Catherine Karen; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Jason Peltier'; 'Joe Findaro'; 'Mike Burns'; 'Susan Ramos'; 'Tony Coelho'

**Subject:** Letters Referenced in Last Week's PR/Legislation Conference Call

**Attachments:** BDCP\_joint letter\_6-15-12.pdf; Secretary Laird Letter to CA Legislature 6-14-12.pdf

Everyone,

Please see the attached letters referenced in last week's conference call.

Thanks!

*~Karen*

Karen Clark

Executive Assistant to Thomas W. Birmingham

Westlands Water District

P.O. Box 6056

Fresno, CA 93710

(c) [REDACTED]

(f) 559.241.6277

Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)



June 15, 2012

The Honorable Ken Salazar  
Secretary, Department of Interior  
1849 C Street, N.W.  
Washington, D.C. 20240

The Honorable John Laird  
Secretary, Natural Resources Agency  
1416 Ninth Street, Suite 1311  
Sacramento, CA 95814

Dear Secretary Salazar and Secretary Laird,

We, the undersigned, write to urge you to make the key necessary decisions in the coming days and weeks to develop a proposal of water system and ecosystem improvements via the Bay Delta Conservation Plan (BDCP) to address the ongoing crisis in the Sacramento-San Joaquin Delta. Our organizations fully support California's co-equal goals of water supply reliability and ecosystem restoration for the Delta. Decisions to craft a BDCP package that restores a reliable water supply for the California economy, and recovers this treasured estuary, are essential to achieving the co-equal goals.

We encourage the agencies to adhere to their anticipated timeline and move forward with a decision as quickly as possible in the coming year. Our state cannot afford further delays in this process, as our water system is in desperate need of infrastructure upgrades to protect water supply from natural disasters and climate change, address environmental needs, and improve reliability for our state's economy.

We fully realize both the complexity of the Delta challenge and the difficulty of shifting from the planning phase to the deciding phase. Yet the BDCP is clearly at that crossroads. Thousands of pages of scientific and technical information released over the past months have provided the necessary building blocks for decisions. Public water agencies are on a path to spend nearly a quarter of a billion dollars on planning before the first investments can be made on actual improvements.

There will always be a degree of scientific uncertainty in the Delta. There will always be differing views. There will always be stakeholders with a passion for one of the co-equal goals more than the other. We recognize that the BDCP, with hundreds of public meetings, has received considerable input. What we need now is a robust proposal that advances both water supply reliability and Delta restoration in a workable fashion.

The evidence is overwhelming that the status quo is a grave threat to the Delta, from the seismic risk to levees to the many stressors facing key fish species such as salmon. The time to act is now. Without these infrastructure upgrades, not only will the Delta fail to receive the needed environmental improvements, but communities across the state will be at risk of water disruptions, new construction and development projects could be derailed, and we could lose new industry investments in the state due to the lack of a clean, reliable water supply.

We appreciate your leadership to get the BDCP to this critical decision stage. We urge you, now, to seize this rare moment in California water history to move the Delta toward an era of action and positive change.

Sincerely,

A handwritten signature in black ink, appearing to read "Tom Nassif".

Tom Nassif  
President and CEO, Western Growers Association

A handwritten signature in black ink, appearing to read "Rex Hime".

Rex Hime  
President & CEO, California Business Properties Association



Jim Earp  
Executive Director, CA Alliance for Jobs



Jose Mejia  
Director, California State Council of Laborers



Richard Lyon  
Senior Vice President, California Building Industry Association



Daniel M. Curtin  
Director, CA Conference of Carpenters



Allan Zaremberg  
President & CEO, California Chamber of Commerce



Tim Cremins  
Political Director Western Region, International Union of Operating Engineers

cc. Jerry Meral, California Natural Resources Agency



June 14, 2012

Dear Honorable Members:

Thank you for your letter of May 24. Your concerns about possible delays in the completion of the Bay Delta Conservation Plan (BDCP) are keenly appreciated. I can assure you, BDCP is still on track. We continue to work in close concert with our federal partners on this project, and the details that we are now in the process of finalizing will provide California with an improved water system to serve the best interests of all our communities.

I deeply value your acknowledgement of the extraordinary level of cooperation and consensus that has grown out of the open and transparent process in which BDCP has evolved. We promised from the outset that BDCP would be guided by the best scientific and economic analysis. The recent announcement that we were delaying the release of the final environmental impact documents was an extension of our ongoing commitment to that same spirit of transparency and collaboration.

As you may know, prior to your letter being written, representatives of the California Natural Resources Agency spent two days conducting a detailed review of the project with Deputy Secretary of the Interior David Hayes and the biologists and other environmental experts in the state and federal regulatory agencies who will ultimately have to pass judgment on BDCP. As a result, I feel that we are on track for the joint announcement by Governor Brown and Secretary of the Interior Ken Salazar later this summer.

There are many key issues for BDCP to address, both in relationship to more wide-ranging discussions about long-term water supply reliability and the sustainability of native fisheries. BDCP must combine the effects of flow criteria, habitat restoration and other actions on the Delta ecosystem and grapple openly with scientific uncertainties that challenge resource management decisions to define a project that can ultimately be permitted. The analytical methodology used by the BDCP will be revised to reflect comments made by the permitting agencies, and that work is well underway. While it is a groundbreaking effort, the Effects Analysis is still a work in progress. It is undergoing rigorous state and federal agency review, independent scientific peer review, and will continue to be refined as the process moves forward.

There is no question of the urgency you express on behalf of your constituents and the millions of other Californians who will benefit from the development of BDCP. But there's no doubt as well of the extraordinary progress we have been able to achieve with your support and encouragement. Because of that, we can continue to focus on the important – and time consuming – scientific study that must be done to make this historic effort successful.

Six years ago, when BDCP began, it was hard to imagine that we would ever break through the regional and institutional conflicts that had blocked improvements to the water system for nearly half a century. Today, with BDCP, we have cleared a path toward restoring the reliability of a water system that has been the key to California's prosperity.

We rely on you to help carry the good news about BDCP's progress to your colleagues in government and to the communities you serve. For all that you've done already to help expand the growing consensus in support of BDCP, thank you.

Sincerely,



John Laird  
Secretary for Natural Resources

1416 Ninth Street, Suite 1311, Sacramento, CA 95814 Ph. 916.653.5656 Fax 916.653.8102 <http://resources.ca.gov>

Baldwin Hills Conservancy • California Coastal Commission • California Coastal Conservancy • California Conservation Corps • California Tahoe Conservancy  
Coachella Valley Mountains Conservancy • Colorado River Board of California • Delta Protection Commission • Delta Stewardship Council • Department of Boating & Waterways • Department of Conservation  
Department of Fish & Game • Department of Forestry & Fire Protection • Department of Parks & Recreation • Department of Resources Recycling and Recovery • Department of Water Resources  
Energy Resources, Conservation & Development Commission • Native American Heritage Commission • Sacramento-San Joaquin Delta Conservancy • San Diego River Conservancy  
San Francisco Bay Conservation & Development Commission • San Gabriel & Lower Los Angeles Rivers & Mountains Conservancy • San Joaquin River Conservancy  
Santa Monica Mountains Conservancy • Sierra Nevada Conservancy • State Lands Commission • Wildlife Conservation Board





**From:** Jason Peltier

**Sent:** Monday, July 9, 2012 9:47 AM

**To:** Chris Daley; Philip Williams; Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLoyd Fryer; Martin McIntyre; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheehan,Rebecca D; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** so much wrong here... repetition works for them.

<http://www.bohemian.com/gyrobase/delta-blues/Content?oid=2301149&showFullText=true>

## Delta Blues

Can salmon survive California's 'Peripheral Canal'?

BY ALASTAIR BLAND



click to enlarge

- **SPAWNED** Gov. Brown's proposal to send more water to Southern California threatens the resurgent salmon population.

Chinook salmon are abundant this year in one of the best seasons in local fishing memory, with sport and commercial fishermen reeling in easy boatloads of the most prized food and game fish on the Pacific Coast.

Still, a local conservation group warns that all this could change if state officials in Sacramento, now plotting the near future of California's water-development infrastructure, approve and build a large canal intended to deliver Sacramento River water to Southern California.

The project has been tentatively called the "Peripheral Canal" for decades since state voters rejected a proposal to build such a conveyance structure in 1982. Opponents of the canal say the project would remove so much water from the Sacramento River that it would make the estuary habitat of the Delta, where juvenile salmon spend their first six months of life, incapable of supporting certain native fishes.

But now, the "Peripheral Canal" plan is back on the drawing board of state government officials, including Gov. Jerry Brown—and the Golden Gate Salmon Association, based in Petaluma, wants to see the project halted before it destroys one of the West Coast's largest runs of Chinook salmon.

"These are critical times, in the next year or two, for what the Bay-Delta and its salmon will look like for the rest of our lives," says Victor Gonella, founder and president of the Golden Gate Salmon Association. "It's a rare time. We're sitting here while our future is shaping up."

Chinook salmon spawn in many watersheds along the West Coast, as far north as Alaska's Yukon River. The Sacramento River is the southernmost stronghold of the species, but its salmon runs have seen a roller-coaster ride in the last decade between record high and record low levels. Experts largely agree that water conditions, including flow rates of the river and Delta, where baby salmon spend their first months of life, have a direct effect on salmon abundance.

State and federal records show a long-term average spawning return of the fall-run Chinook, the most historically abundant of the Sacramento's four distinct runs of salmon, to be between 300,000 and 400,000 fish. But 2009's record low of 39,000 spawners came after water-pumping rates from the Delta jumped by 20 percent, to all-time high levels, from 2003 to 2006.

Fishermen fear that the proposed canal is likely to cause an overall decrease in water-flow rates, causing a decline in salmon numbers.

"[Gov.] Brown needs to scrap the 'Peripheral Canal' until further notice," says Mike Hudson, a commercial fisherman in Oakland. Hudson says the current fishing is as good as it has been in at least five years, but adds that he isn't confident about the future. "Along the entire West Coast we have managed to stop overfishing. Now, if we could only stop overfarming we'd have it made."

Peter Moyle, a fisheries biologist at UC Davis, says that the current system for water removal from the Sacramento River, which involves two giant pumps in the Delta, reverses the entire flow of the estuary system when the pumps are operating at full force. This phenomenon confuses young salmon trying to migrate out to sea, Moyle says. Many become lost or stranded in sloughs, where they make easy pickings for predators. Others are sucked directly into the pumps and killed. Moyle says the canal, which would draw water from a location far upstream of the Delta, could be beneficial for the Delta habitat since the reverse flow effect would no longer occur.

But he says that a healthy salmon population requires a minimum amount of water flowing through the Delta and out to sea.

"A conveyance in any form will be positive from a native fish perspective only if it is connected to no net increase in diversion [of water]," Moyle says.

What makes Gonella at the Golden Gate Salmon Association nervous is that current plans for the canal's construction include a 15,000-cubic-foot-per-second capacity, enough to virtually suck the Sacramento River dry. Gonella wants to see that capacity reduced, or see a guarantee written into the plans for the "Peripheral Canal" that assures that recipients of the water could never turn the flow up to full.

The current surge in salmon abundance seems to come partly in response to a federal law that took effect three years ago that limits how much water can be removed from the Sacramento River Delta during the winter and spring months, when juveniles of the protected spring- and winter-run salmon are present in the Delta. The fall-run, which is not a listed species, has seen benefits from these water-restriction laws.

Still, habitat conditions in the Delta are generally so poor that baby salmon born in the Sacramento's tributaries must be transported by the millions in trucks and released into the bay, downstream of the Delta and its dangerous water pumps. This trucking program, however, may be downsized due to state budget cuts—which could be a disaster for salmon numbers. Jon Rosenfield, a conservation biologist at the Bay Institute in Novato, says that in spite of the Chinook salmon's hardiness, the Sacramento River has been so severely altered from its natural state by dam-building and water diversions that it can no longer support self-sustaining runs of salmon.

"What [salmon] require is pretty simple," he says. "Sufficient cold water must flow unimpeded from the mountains to the ocean during the appropriate season. The fact that salmon populations are declining dramatically throughout the Central Valley indicates how badly our thirst for water has overtaxed the capacity of our rivers to support wild salmon populations."

Gov. Brown has told reporters that the canal, which is now being designed as part of the Bay Delta Conservation Plan and which could be in operation within several years, will cost \$15 billion. But others have second-guessed the governor and believe the water-conveyance project could cost state voters as much as \$50 billion or more.

Other critics have made the case that the "Peripheral Canal" could be illegal. In 1992, the Central Valley Project Improvement Act was passed, requiring that the federal government, in words from the Fish and Wildlife Service's website, "protect, restore, and enhance fish, wildlife, and associated habitats in the Central Valley and Trinity River basins of California." Conservationists say this law has been continuously broken for 20 years, and that the "Peripheral Canal" will only further deteriorate the habitat of the Sacramento River's native fish.

Gonella asserts that people must not be deceived by the summer's great salmon fishing into believing the fishery is healthy and stable.

"We're having a great year, and they're expecting a great year next year," Gonella says. "But people don't realize that if we don't get this right, it's game over. The salmon will be gone."

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## Comments (2)

Showing 1-2 of 2

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Those who oppose the Peripheral Canal fail to include all of the facts in their arguments because the facts do not support their position. Claims that a canal would "remove so much water" are just that---claims. Operational limits of a proposed canal have yet to be finalized yet draft elements of the Bay Delta Conservation Plan (BDCP) already include limits on exports when natural river flows are lower.

There are a myriad of factors impacting salmon (and other fish) populations including water quality, invasive species, predatory fish, and ocean conditions. A recent report by the National Research Council stated that improving ecological conditions in the Delta will fail if they don't target multiple stressors, contrary to the constant drum beat calling for a reduced water supply for farms, homes and businesses.

The Sacramento River fall Chinook escapement, ocean harvest and river harvest index clearly shows population (and harvest) peaks in 1988, 1995, and 2002 with corresponding dips in the intervening years. It is normal to expect a rise in salmon numbers now and in the next few years and that's exactly what we're seeing.

Blaming the pumps or deliveries of water that flow through the Delta as the primary cause of reduced salmon populations is simply an exercise in hiding the facts.

Mike Wade  
California Farm Water Coalition

report0 likes, 1 dislike  like  dislike

Posted by [Mike Wade](#) on 07/06/2012 at 10:16 AM



Mr. Wade says, "...claims that a canal would "remove so much water" are just that---claims. Operational limits of a proposed canal have yet to be finalized yet draft elements of the Bay Delta Conservation Plan..." But that's exactly the point. There are very long lists of important questions that remain unanswered about how this massively expensive plumbing system would work, it's impact on the ecosystem, and of course how it will be paid for and who pays, that have NOT been answered.

It is not unreasonable to put science and policy BEFORE building this thing. But those who want it don't care about answering the questions. They want what they want and that's all that matters.

Salmon Water Now asks Governor Brown 7 questions that taxpayers and ratepayers would like to have answered. Maybe Mr. Wade has some answers. You can see the short video and the questions here:

<http://www.youtube.com/watch?v=I-n1LK1QVqc...>

Those who are pushing for the canal to be built ought to stop and think about what it would mean. The march to approval

and building needs to be slowed down. Take a look at another video that also helps put this debate in perspective:

Stop and Think: <http://www.youtube.com/watch?v=OnV6MCvXK38...>

**From:** Jason Peltier

**Sent:** Friday, July 13, 2012 9:04 AM

**To:** Joe Findaro; David Bernhardt; David Reynolds; Brad Hiltcher; Jerry Meral; King Moon, Laura; 'Patterson,Roger K'

**CC:** Karen, Catherine; T Birmingham

**Subject:** DC meeting coordination

DC folks, please include Catherine Karen in your organizing, brainstorming, assignment giving meetings as the schedule for our DC visit is developed.

Karen, Catherine [ckaren@Sidley.com](mailto:ckaren@Sidley.com)

When we know who from the environmental community might be joining us, you can also coordinate with their reps.

Also, it looks like Jerry and I could be available to meet with you [and other DC reps] for a briefing on developments on Monday [7/30] if that would be of value.

Catherine, could you provide your contact numbers.

**From:** Karen, Catherine  
**Sent:** Friday, July 13, 2012 9:12 AM  
**To:** jpeltier@westlandswater.org; joe.findaro@akerman.com; dbernhardt@bhfs.com; dlreyns@sso.org; bhiltscher@mwdh2o.com; jerry.meral@resources.ca.gov; lkmoon@water.ca.gov; RPatterson@mwdh2o.com  
**CC:** tbirmingham@westlandswater.org  
**Subject:** Re: DC meeting coordination

Hi Jason,  
Thanks for the note. My contact numbers are as follows: 2027368368 (office); 7034773449 (cell).  
Catherine

---

**From:** Jason Peltier [mailto:jpeltier@westlandswater.org]  
**Sent:** Friday, July 13, 2012 11:04 AM  
**To:** Joe Findaro <joe.findaro@akerman.com>; David Bernhardt <dbernhardt@bhfs.com>; David Reynolds <dlreyns@sso.org>; Brad Hiltscher <bhiltscher@mwdh2o.com>; Jerry Meral <jerry.meral@resources.ca.gov>; King Moon, Laura <lkmoon@water.ca.gov>; 'Patterson,Roger K' <RPatterson@mwdh2o.com>  
**Cc:** Karen, Catherine; T Birmingham <tbirmingham@westlandswater.org>  
**Subject:** DC meeting coordination

DC folks, please include Catherine Karen in your organizing, brainstorming, assignment giving meetings as the schedule for our DC visit is developed.

Karen, Catherine [ckaren@Sidley.com](mailto:ckaren@Sidley.com)

When we know who from the environmental community might be joining us, you can also coordinate with their reps.

Also, it looks like Jerry and I could be available to meet with you [and other DC reps] for a briefing on developments on Monday [7/30] if that would be of value.

Catherine, could you provide your contact numbers.

-----  
IRS Circular 230 Disclosure: To comply with certain U.S. Treasury regulations, we inform you that, unless expressly stated otherwise, any U.S. federal tax advice contained in this communication, including attachments, was not intended or written to be used, and cannot be used, by any taxpayer for the purpose of avoiding any penalties that may be imposed on such taxpayer by the Internal Revenue Service. In addition, if any such tax advice is used or referred to by other parties in promoting, marketing or recommending any partnership or other entity, investment plan or arrangement, then (i) the advice should be construed as written in connection with the promotion or marketing by others of the transaction(s) or matter(s) addressed in this communication and (ii) the taxpayer should seek advice based on the taxpayer's particular circumstances from an independent tax advisor.

\*\*\*\*\*  
\*\*\*\*\*

This e-mail is sent by a law firm and may contain information that is privileged or confidential. If you are not the intended recipient, please delete the e-mail and any attachments and notify us immediately.

\*\*\*\*\*  
\*\*\*\*\*

**From:** Bernhardt, David L.  
**Sent:** Friday, July 13, 2012 9:33 AM  
**To:** Jason Peltier  
**Subject:** Re: DC meeting coordination

Are you coming in on the 30th?

David Bernhardt  
202-872-5286  
202-████-████ (cell)

On Jul 13, 2012, at 9:04 AM, "Jason Peltier" <[jpeltier@westlandswater.org](mailto:jpeltier@westlandswater.org)> wrote:

DC folks, please include Catherine Karen in your organizing, brainstorming, assignment giving meetings as the schedule for our DC visit is developed.

Karen, Catherine [ckaren@Sidley.com](mailto:ckaren@Sidley.com)

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Catherine, could you provide your contact numbers.

**From:** Jason Peltier  
**Sent:** Friday, July 13, 2012 9:38 AM  
**To:** 'Bernhardt, David L.'  
**Subject:** RE: DC meeting coordination

Yes.

---

**From:** Bernhardt, David L. [mailto:DBernhardt@BHFS.com]  
**Sent:** Friday, July 13, 2012 9:33 AM  
**To:** Jason Peltier  
**Subject:** Re: DC meeting coordination

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David Bernhardt  
202-872-5286  
202-████-████ (cell)

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Catherine, could you provide your contact numbers.

**From:** Tom Birmingham

**Sent:** Thursday, July 19, 2012 9:04 AM

**To:** 'Karen Clark'

**CC:** 'Manson Craig'; 'O'Hanlon, Daniel'; 'Mathews, Mark J.'; 'Treece, Lawrence W.'; 'Bernhardt, David L.'

**Subject:** Letter to Reclamation re Repayment Contract

**Attachments:** Ltr to Stevenson re Drainage Repayment Contract.docx

Karen,

Please put the attached letter in final form, place the letter on District letterhead, attach my signature, and mail the letter to Reclamation. Please return a pdf of the letter to me for electronic distribution.

Thank you,

Tom

July 19, 2012

Mr. Richard M. Stevenson  
Division of Resources Management  
Bureau of Reclamation,  
Department of Interior, Mid-Pacific Regional Office  
2800 Cottage Way  
Sacramento, California 95825-1898

Re: Drainage Repayment Contract Negotiations Between the United States Bureau of Reclamation ("Reclamation") and Westlands Water District ("Westlands") – Central Valley Project, California.

Dear Mr. Stevenson:

This letter is in response to your July 6, 2012 letter to Mr. Don Peracchi, President of Westlands. That letter states that the Bureau of Reclamation has expended "significant resources" toward the design of a drainage collector system in the central sub-unit of the District, and it must have an executed repayment contract in a timely manner to meet Reclamation's control schedule. The letter requests that Reclamation and the District resume negotiations of a repayment contract as soon as possible.

Westlands does not understand the need for an executed repayment contract in order for Reclamation to meet its control schedule. As you and I discussed during one of the negotiation sessions, Westlands believes that there is no need for the parties to enter into a new repayment agreement because an adequate repayment mechanism already exists. As you know, the United States and Westlands entered into an interim renewal contract for water and drainage services on December 27, 2007 ("2007 Contract"), which was renewed most recently on February 29, 2012. Article 16 of the 2007 Contract provides: "(c) The Contracting Officer shall notify the Contractor in writing when drainage service becomes available. Thereafter, the Contracting Officer shall provide drainage service to the Contractor at rates established pursuant to the then-existing ratesetting policy for Irrigation Water. . . ."

This provision should suffice to provide a repayment mechanism for any contemplated drainage work within Westlands. This is particularly true since all facilities constructed pursuant to the 2007 Record of Decision to provide drainage service to Westlands, including all main drainage features and the drainage collection facilities, will be constructed entirely within Westlands and provide service only to Westlands. The drainage provisions in the 2007 Contract, as renewed, will remain operative unless and until the Federal Court of Claims rules in favor of Westlands on its claim for either total



Mr. Richard M. Stevenson  
July 19, 2012

breach of contract or anticipatory repudiation of contract in the drainage litigation filed on January 6, 2012, and in these circumstances, a separate repayment contract for a drainage collection system in the central sub-unit of Westlands is simply not necessary or required.

In the event that Westlands does enter into a new repayment contract at some point, any such contract will have to contain language protecting Westlands' litigation position in the Federal Court of Claims. In other words, any new repayment contract must include a provision stating that Westlands' execution of the contract is without prejudice to any of its litigation claims and positions, and will not be used against Westlands in the drainage litigation for any purpose.

Please let Westlands know how Reclamation would like to proceed.

Very truly yours,

Thomas W. Birmingham  
General Manager

**From:** Tom Birmingham  
**Sent:** Friday, July 20, 2012 11:12 AM  
**To:** 'Tony Coelho'; 'Bernhardt, David L.'; joe.findaro@akerman.com; 'Karen, Catherine'  
**Subject:** FW: Restoring the Delta, Protecting our Future  
**Attachments:** Bay Delta Brochure\_071912\_web.pdf

FYI

Beau Goldie is the general manager of Santa Clara Valley Water District and Jill Duerig is the general manager of Zone 7 Water Agency. I have attached a copy of the document for your reference.

---

**From:** Tom Birmingham [mailto:tbirmingham@westlandswater.org]  
**Sent:** Friday, July 20, 2012 11:07 AM  
**To:** 'bgoldie@valleywater.org'; 'jduerig@zone7water.com'  
**Cc:** 'Kightlinger,Jeffrey'; 'Dan Nelson'; 'jbeck@kcwa.com'; 'Peltier Jason'; 'rpatterson@mwdh2o.com'; 'Walthall, Brent'  
**Subject:** Restoring the Delta, Protecting our Future

Beau and Jill,

Again, I want to say what a great piece your agencies produced. I sent a copy of "Restoring the Delta, Protecting our Future" to Jim Costa and requested that he follow-up with Mike Honda and Zoe Lofgren to let them know that he thinks their constituents have produced an excellent document explaining the necessity for the BDCP and its value to the state. The House is out of session today, but will be in session on Monday, and Jim said he would discuss the document with them on Monday.

Great job.

Tom

# Restoring the Delta

## Protecting our Future

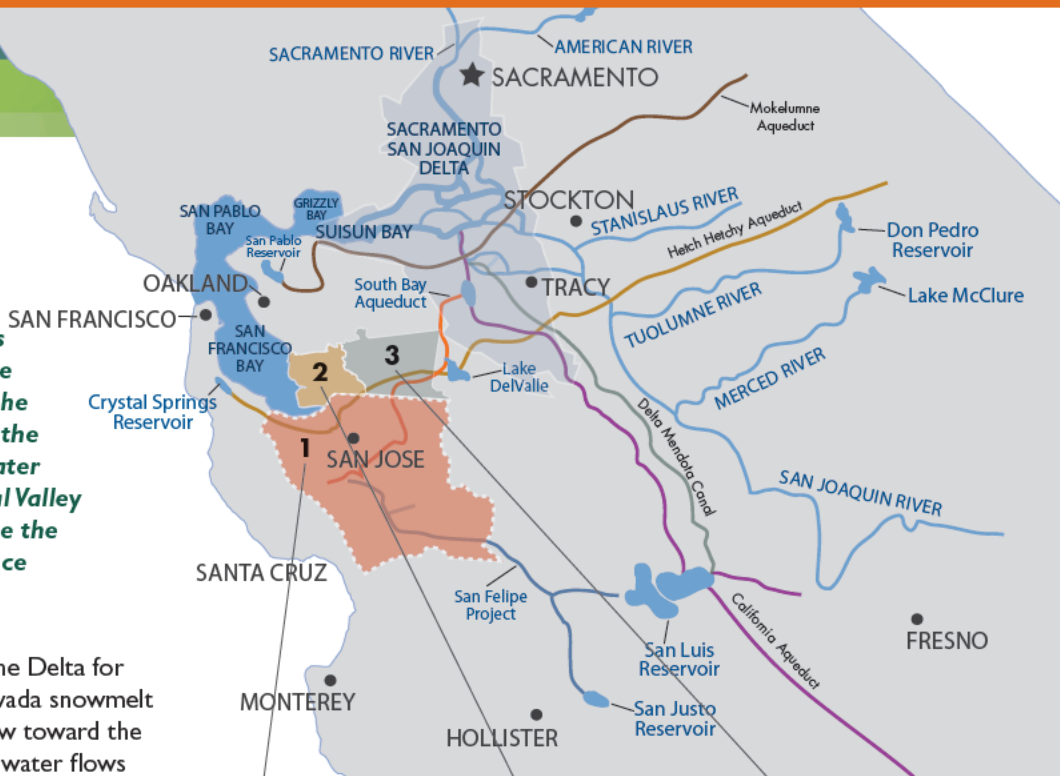
*The Delta serves as a unique “hub” in California’s water system, receiving runoff from other watersheds that goes for many beneficial uses throughout the state. The Delta provides a portion of the drinking water for nearly two-thirds of the state’s population....the two largest water systems in the state—the federal Central Valley Project and the State Water Project—use the Delta as a hub of their water conveyance system. —Delta Stewardship Council*

The San Francisco Bay Area depends on the Delta for 2/3 of its drinking water supply. Sierra Nevada snowmelt and rainfall fills rivers and streams that flow toward the San Francisco Bay. Much of that mountain water flows through the Sacramento-San Joaquin River Delta to communities throughout the Bay Area.

The Delta is an essential feature of our water system. Yet, after decades of alterations, the Delta is far from the natural estuary it once was. The Delta’s 150-year old man-made network of levees is old and fragile.

Without an effective conservation and renewal strategy, the Delta’s sensitive ecosystem and water transport system will continue to deteriorate, threatening the delivery of safe, reliable drinking water to the nearly 2.5 million residents that we serve in the East Bay and Silicon Valley.

The statewide Bay Delta Conservation Plan (BDCP) effort is attempting to achieve **water supply reliability** and **ecosystem restoration for the Delta**. To sustain our economy and our way of life, we must find a balanced solution that restores the Delta ecosystem and assures long-term sustainable water supplies.



### 1 Santa Clara Valley Water District

Provides services to:  
15 cities throughout  
Santa Clara County

Serves:  
1,800,000 people  
40%

**Delta-conveyed water**  
All sources:  
40% Delta-conveyed water  
40% groundwater and local  
surface water  
15% San Francisco Regional  
Water System  
(Sierra Nevada source)  
5% recycled water

### 2 Alameda County Water District

Provides services to:  
Fremont, Newark, Union City

Serves:  
340,000 people  
40%

**Delta-conveyed water**  
All sources:  
40% Delta-conveyed water  
25% groundwater and local  
surface water  
20% San Francisco Regional  
Water System  
(Sierra Nevada source)  
15% Desalination

### 3 Zone 7 Water Agency

Provides services to:  
Dublin, Pleasanton, Livermore,  
Dougherty Valley

Serves:  
220,000 people  
87%

**Delta-conveyed water**  
All sources:  
87% Delta-conveyed water  
13% local surface water

**Bay Delta by the numbers**

**Be informed. Know the facts. Get involved.**  
**Our future depends on it.**

**Beau Goldie, CEO**  
Santa Clara Valley Water District



**Jill Duerig**  
General Manager  
Zone 7 Water Agency



**Walt Wadlow**  
General Manager  
Alameda County Water District



# Benefits of Bay Delta Conservation Plan



## »» Significant improvement in California's drinking water delivery system

The BDCP creates a long-term plan for improving the state's existing water delivery system which needs urgent attention.

There is a two-in-three chance that 100-year floods or earthquakes will cause catastrophic flooding and significant change in the Delta by 2050. —Jeffrey Mount, UC Davis

The BDCP reduces the risks of water pumping restrictions which have already affected Bay Area and statewide water supply and created uncertainty regarding future reliability.

Water deliveries from the Delta have been reduced significantly in recent years due to years of drought and other systemic problems in the Delta. Left unaddressed, this will create tremendous impacts on California's economy, environment, agricultural industry and millions of residents throughout the state. —Delta Stewardship Council

## »» Economic certainty for the Bay Area's business community, including Silicon Valley

The BDCP enhances and protects California's extensive water delivery system which is critical to our economic vitality and key to maintaining our competitive advantage.

Water is indeed vital to the California economy... It is a scarce resource, subject to numerous and competing demands—including increasing demands for environmental uses. —Public Policy Institute of California

Water shortages would have severe economic consequences. Water reduction scenarios of 10%-30% would result in a decrease in revenue of \$883 million to more than \$10 billion in Santa Clara County alone. —David Sunding, PhD, The Brattle Group

The BDCP improves water quality, benefiting industrial processes and reducing costs to business operations.

The development of the Delta's lands, the channelization of its waterways, the discharge of pollutants, the introduction of non-native species, the alteration of flows, and the diversions of water from the system have combined to degrade the quality of water and habitat. —Public Policy Institute of California

## »» Unprecedented ecosystem restoration and conservation investments in the Delta

The BDCP supports the recovery of endangered or threatened aquatic species and their habitat.

Many factors have contributed to the Delta's decline. Agricultural, industrial and urban runoff has polluted its waters. Invasive, non-native species have adversely impacted the food chain and, as a result, native fish and wildlife populations suffer. —Delta Stewardship Council

The BDCP restores tens of thousands of acres of tidal marsh and other habitat lost in past decades.

Ecological investments in the Delta will ultimately benefit California's economy by securing higher-quality, more reliable water for agriculture and urban use, averting expensive responses to natural disasters, and expanding recreational opportunities. Ecosystem and economic objectives are mutually dependent. —Public Policy Institute of California

## »» Collaborative multi-year process is developing science-based solutions

The BDCP addresses one of the most complex resource issues in California and has been championed by both a Republican and Democratic governor.

The BDCP represents the best, most collaborative decision-making effort to date on these elusive and intractable issues. Its successful completion and implementation is imperative for California's future. —Lester Snow, Secretary for Natural Resources under Governor Schwarzenegger

The BDCP process has brought together local water agencies, environmental and conservation organizations, state and federal agencies, agricultural and other interest groups to develop solutions that are publicly-available and reviewed by independent scientific experts.

A unique confluence of disparate interests have come together in the BDCP, making it perhaps the best hope of a broadly-supported, comprehensive solution today. —California Farm Bureau Federation

# Myths vs. Facts

## **MYTH** We can conserve our way out of our water problems.

**FACTS** Water use efficiency is increasing; per capita water use is decreasing.

- Santa Clara County has reduced its water use by 15% since 1990 with a population growth of 300,000.
- Despite an increase in population of 28%, Alameda County Water District customers are using the same amount as they did in 1990.
- Zone 7 Water Agency customers have reduced their consumption by over 20% for a population that has nearly doubled! Agricultural use has been cut by over 20% through more efficient irrigation methods.

While conservation will continue to be an extremely important tool, even the greatest commitment to water use efficiency would not supplant imported water.

## **MYTH** We just need to fix the Delta's levees.

**FACTS** Many of the 1,100 miles of Delta levees are built on soft peat soils around islands up to 25 feet below sea level that are continuing to sink. Replacing or shoring up these levees would be very costly and challenging, particularly in light of climate change and sea level rise.

The instability and interdependence of levees failure of one levee can affect others are likely to be major issues for achieving any measure of water-supply reliability or ecosystem rehabilitation. Continuing the status quo of improving levees will not always be the most environmentally sustainable or economically defensible response in the years ahead. —National Research Council of the National Academies

## **MYTH** We don't need a Peripheral Canal.

**FACTS** A key component to any complete Delta solution is the construction of a new water conveyance (delivery) facility. The existing system has turned the Delta, originally a fluctuating-salinity estuary, into a freshwater basin. It has also created unnatural north to south flows in the Delta, confusing native species and disturbing the ecosystem.

Peripheral canal is the best approach for addressing both ecosystem and economic risks. Instead of pulling water through the Delta to the pumps (the current system), a peripheral canal (or tunnel) would tap water upstream on the Sacramento River and move it around (or underneath) the Delta to the pumps. —Public Policy Institute of California



## **MYTH** Any new facilities would damage the Delta.

**FACTS** The Delta is among the most modified deltaic systems in the world. New facilities would be designed to restore natural flow patterns. A new facility would set strict limits on water flows and provide the flexibility to take advantage of increased supplies in wet winters as insurance against future dry years.

This change would be good for native fish: fewer would be trapped in the pumps and most would benefit from an increase in natural tidal flows within the Delta. A peripheral canal or tunnel has the best potential for safeguarding the Delta's environment while maintaining water supply reliability. —Public Policy Institute of California

## **MYTH** Nothing has happened yet, so what's the big deal?

**FACTS** California is experiencing major water issues. There are already restrictions on water deliveries through the Delta. Growing recognition of California's changing conditions and mounting threats have brought competing stakeholders together to act. The time for solutions is now.

The Delta of the future will be affected by worsening land subsidence, heightened seismic risk and possible effects of climate change (both sea level rise and changes in storm timing, intensity, and frequency). —California Natural Resources Agency, Department of Water Resources, and Department of Fish and Game

New water delivery facilities will create between 80,000 and 130,000 new construction and operation jobs. —David Sunding, PhD, The Brattle Group

California's current water system raises several red flags. Catastrophic interruptions of water supplies from earthquakes and floods could cause large short-term losses; unreliable supplies could also jeopardize business and infrastructure investments that support economic growth. —Public Policy Institute of California





## Meeting the Bay Area's water needs

Our region depends upon clean reliable water supplies. Our agencies manage complex integrated water systems that not only provide safe drinking water for children and families but also water for neighborhoods and businesses, the environment and wildlife, fire protection, agriculture and recreation. We have managed through water shortages, droughts, earthquakes and floods. And we have instituted many measures to increase water use efficiency in our regions in order to reduce our reliance on the Delta.

We must continue to innovate and adapt to changing conditions. That is why we are exploring and developing new technologies and best practices around water storage and groundwater banking, conservation and water recycling, stormwater-capture and desalination. As important as these local measures are, they do not eliminate the need for a workable Delta solution that restores the health of the Delta ecosystem and assures sustainable water supplies.

Our agencies have been actively involved in this process for years, and we are committed to working toward a balanced solution that is based on sound science and effective water management and ensures our region's ongoing health and vitality. **Our future depends on it.**

### What others say about the BDCP...

Recognizing the primacy of water issues to the health of our state and businesses, the Silicon Valley Leadership Group supports moving forward with the Bay Delta Conservation Plan (BDCP) process.  
—Silicon Valley Leadership Group

The (Bay Delta) Conservation Plan aims to provide a framework for issuing those permits that guarantees sufficient water for wildlife. The plan also hopes to achieve comprehensive protection for threatened and endangered species through an ecosystem-focused approach.  
—Environmental Defense Fund

The risk of inaction is unacceptable. An earthquake could cut off a key water supply to 25 million people in the state and more than 3 million acres of prime farmland, hurting families, businesses, communities and our economy. Restoring a reliable water supply is key to the long-term economic stability of Silicon Valley, the San Joaquin Valley and Southern California. —Regional Economic Association Leaders of California

The BDCP promises to make a major contribution toward resolving California's current water crisis. The one thing that is absolutely certain is that unwavering opposition to California's efforts to solve the water crisis is not in anyone's better interest. —California Resources Secretary, John Laird

The BDCP process, in tandem with the Delta Stewardship Council, offers perhaps the best chance to restore the ailing Delta ecosystem, and provide a more sustainable future for the Delta and California water supplies. —The Nature Conservancy

Simply put, it is the large urban population centers that will suffer the greatest social, economic, and environmental harm if an earthquake or other natural disaster disrupts Delta water supplies. The evidence is clear that until the conveyance improvements and environmental investments proposed in the BDCP are put in place, the economic, social, and environmental well-being of California's urban communities is at risk.  
—California Latino Water Coalition and California State Conference of the NAACP

We agree that the status quo is not acceptable and a new approach for managing water supplies and the aquatic environment in the Delta is necessary. We strongly support the BDCP's co-equal goals of restoring the critically important Sacramento-San Joaquin Delta and regaining water supply reliability for cities, farms, and businesses throughout California. —U.S. Senators Dianne Feinstein and Barbara Boxer

**From:** Jason Peltier

**Sent:** Thursday, July 26, 2012 8:41 AM

**To:** 'Karen Clark'; 'Alison MacLeod'; 'Carmela McHenry'; 'Carolyn Jensen'; 'Catherine Karen'; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Joe Findaro'; 'Mike Burns'; 'Susan Ramos'; 'Tony Coelho'; T Birmingham

**Subject:** Radio fun

Karla, a reporter, a restore the delta rep and I will be on KQED's Forum radio show this am from 9-10:

<http://www.kqed.org/radio/>

**From:** Jason Peltier

**Sent:** Thursday, July 26, 2012 11:12 AM

**To:** 'Karen Clark'; 'Alison MacLeod'; 'Carmela McHenry'; 'Carolyn Jensen'; 'Catherine Karen'; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Joe Findaro'; 'Mike Burns'; 'Susan Ramos'; 'Tony Coelho'; T Birmingham

**Subject:** link to video of Delta Members press conf yesterday...

<http://www.youtube.com/watch?v=01AwRfzEajo&feature=youtu.be>



**From:** Jason Peltier

**Sent:** Monday, July 30, 2012 9:06 AM

**To:** Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLOYD Fryer; Martin McIntyre; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheehan,Rebecca D; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** Mark select

From Bill Kier to Trinity server:

‘Takes me back..

It’s been nearly 20 years, but the late Nat Bingham and I spent nearly a year – fruitlessly - trying to promote mark-selective salmon fishing for CA by seeking a federal appropriations earmark to provide CA Fish & Game with funds for undertaking universal marking of hatchery salmon

We successfully approached then-North Coast Congressman Dan Hamburg and had the earmark in gear before meeting with the DFG opposition at the old NMFS Tiburon Lab.

The DFGers brought in Pacific States Marine Fisheries Commission personnel to beef up their opposition, which, if memory serves, turned on two main concerns : 1- that hooking mortality, particularly for coho, was unacceptably high; and 2- that there were too many management programs that relied on longtime series of fractional marking data to simply chuck it all for a new mark-selective fishing regime

As these things go, critical junctures in the federal appropriation process were missed, Nat and I had trouble figuring out what was going on with the Hamburgers, and, when we did, we found they had quietly shelved our initiative because of the DFG opposition.

Such is the stuff conservation leadership is too often made of

To be fair, not all the opposition came from the fish bureaucrats. Earl Carpenter of Bodega Bay was still regarded as ‘the Captain’ of CA’s commercial salmon fishing fleet and he growled ‘you’re going to be sorry as hell if you succeed – you’re going to find there’s a hell of a lot more naturals out there then you think. ‘Would that it were so!

In those days Jim Martin (cc-ed here), then ODF&W’s fisheries chief was pushing hard – and successfully - for what is now the NW’s universal hatchery marking/mark-selective salmon fishing regime

Fishing with Jim on the Willamette last year for spring salmon (the mainstem Columbia was closed) I tied into a beauty which took me several minutes to crank up close enough to the boat to see the ad fin. It was an absolutely huge, gorgeous fish and my heart filled, frankly, for the opportunity to turn it loose, hopefully to produce more lunkers like him/her

I’m still wrapped around one of the assignments that the visionary Nat Bingham – who’s been gone 14 years now – gave me, and that’s boosting, however I can, genetic stock identification (see, e.g.,

<http://www.pacificfishtrax.org/media/2pagars/Genetics%20CROOS%20Summary%201Jan10.pdf>

Hopefully, between the two technologies – mark-selective fishing and GSI – we can pass salmon on to the next seven generations

Bill Kier

Kier Associates, Fisheries and Watershed Professionals  
P.O Box 915  
Blue Lake, CA 95525  
(707) 668-1822  
Mobile: 707.498.7847

**From:** [env-trinity-bounces@velocipede.dcn.davis.ca.us](mailto:env-trinity-bounces@velocipede.dcn.davis.ca.us) [<mailto:env-trinity-bounces@velocipede.dcn.davis.ca.us>] **On**  
**Behalf Of** Tom Stokely  
**Sent:** Friday, July 27, 2012 8:22 PM  
**To:** [env-trinity@velocipede.dcn.davis.ca.us](mailto:env-trinity@velocipede.dcn.davis.ca.us)  
**Subject:** [env-trinity] Fwd: CBB: Study Analyzes Benefits Of 'Mark-Selective' Fishing For Wild Salmon Populations

**From:** "Sari Sommarstrom" <[REDACTED]@[REDACTED].[REDACTED]>  
**Date:** July 27, 2012 6:16:01 PM PDT  
**To:** "Trinity River e-news" <[env-trinity@velocipede.dcn.davis.ca.us](mailto:env-trinity@velocipede.dcn.davis.ca.us)>  
**Cc:** "Tom\_Stokely" <[tstokely@att.net](mailto:tstokely@att.net)>  
**Subject:** CBB: Study Analyzes Benefits Of 'Mark-Selective' Fishing For Wild Salmon Populations

THE COLUMBIA BASIN BULLETIN:  
Weekly Fish and Wildlife News  
[www.cbbulletin.com](http://www.cbbulletin.com)  
July 27, 2012  
Issue No. 630

### Study Analyzes Benefits Of 'Mark-Selective' Fishing For Wild Salmon Populations

A fish marking practice commonly used in Washington and Oregon could significantly increase wild salmon populations in California, while allowing continued harvest of abundant hatchery populations, according to a recent study published in Marine and Coastal Fisheries.

The article, first published June 18, is authored by Brian J. Pyper of Cramer Fish Sciences and Fish Metrics, Steven P. Cramer of Cramer Fish Sciences and Randolph P. Ericksen of Cramer Fish Sciences and the Wild Salmon Center.

California wild chinook salmon populations, including several populations that are protected under the Endangered Species Act, have declined over the past decades. This has led to increased management restrictions on commercial and recreational fisheries, as well as increased reliance on hatchery-raised fish to support those fisheries.

In Oregon and Washington, nearly all hatchery salmon produced for harvest receive a visible mark, while wild salmon remain unmarked and are therefore easily identified in ocean and river fisheries. When adult salmon are caught, marked hatchery salmon are kept, while unmarked wild salmon in most cases must be released back to the ocean or river.

This practice of "mark-selective fishing" has enabled many salmon fisheries in Oregon and Washington to continue despite serious concerns for the abundance of wild salmon, according to the recently published study. As an example naturally produced fish from a total of 13 salmon and steelhead stocks originating in the Columbia River basin are protected from non-tribal harvest.

Although California has not adopted this practice, the new study suggests that mark-selective fishing could result in substantial increases in wild salmon populations while maintaining important harvest opportunities, the research paper says.

"A harvest strategy that targets hatchery salmon over wild salmon makes sense when hatchery salmon are plentiful but are mixed with depleted wild populations" said Steve Cramer, founding scientist of the consulting firm Cramer Fish Sciences, and co-author of the publication. "If wild salmon populations in California continue to struggle and we do not find a solution that enables targeted capture of hatchery fish while allowing wild fish to escape, then it is likely that salmon fishing in California will be increasingly constrained to low levels."

The study used data on the actual abundance and harvest of chinook salmon in northern California's Central Valley and the ocean off California over two decades (1988-2007) to examine how mark-selective fishing regulations would have affected harvest and spawner abundance.

The study showed that selective fishing could have, if applied to past fishing seasons, doubled the number of wild salmon in California rivers. At the same time, it would have allowed substantial harvests of hatchery fish, depending on the proportion of salmon that were of hatchery origin.

The key results of the study applied to recent years (2001-2007) in which ocean fisheries were constrained to protect weak wild populations.

"We examined a range of plausible scenarios of fishing effort and hatchery salmon abundance," Cramer explained. "When 60 percent or more of the salmon are from hatcheries, the mark-selective scenarios generally allowed for higher total harvests of salmon and modest increases in wild populations compared to the traditional regulations that were in place to constrain harvest and protect wild fish."

The study cited other research that estimated hatchery fish have composed as high as 90 percent of chinook off California in recent years.

About 35 million juvenile chinook are released each year from Central Valley hatcheries, but most of these fish are unmarked.

"The high cost of marking all hatchery fish, and the challenge of working out new methods to estimate catch-and-release mortality of wild salmon has hindered fisheries agencies in California from implementing mark-selective fisheries," Cramer said. "Despite these challenges, the results of our study suggest that serious consideration and evaluation of mark-selective fisheries for California salmon are warranted."

The full study, "Implications of Mark-Selective Fishing for Ocean Harvests and Escapements of Sacramento River Fall Chinook Salmon Populations," can be found here: <http://www.tandfonline.com/doi/pdf/10.1080/19425120.2012.679575>

**From:** Byron Buck  
**Sent:** Monday, July 30, 2012 9:45 AM  
**To:** Jason Peltier  
**Subject:** RE: Mark select

Wow. What struck me is Nat being gone 14 years now. We have accomplished so much since then.....

Byron Buck  
Executive Director  
State and Federal Contractors Water Agency  
916.476.5052  
916.719.9408 cell  
1121 L St. Suite 806  
Sacramento, CA 95811

---

**From:** Jason Peltier [mailto:jpeltier@westlandswater.org]  
**Sent:** Monday, July 30, 2012 9:06 AM  
**To:** Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLOYD Fryer; Martin McIntyre; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheehan,Rebecca D; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; Valerie Connor  
**Subject:** Mark select

From Bill Kier to Trinity server:

‘Takes me back..

It’s been nearly 20 years, but the late Nat Bingham and I spent nearly a year – fruitlessly - trying to promote mark-selective salmon fishing for CA by seeking a federal appropriations earmark to provide CA Fish & Game with funds for undertaking universal marking of hatchery salmon

We successfully approached then-North Coast Congressman Dan Hamburg and had the earmark in gear before meeting with the DFG opposition at the old NMFS Tiburon Lab.

The DFGers brought in Pacific States Marine Fisheries Commission personnel to beef up their opposition, which, if memory serves, turned on two main concerns : 1- that hooking mortality, particularly for coho, was unacceptably high; and 2- that there were too many management programs that relied on longtime series of fractional marking data to simply chuck it all for a new mark-selective fishing regime

As these things go, critical junctures in the federal appropriation process were missed, Nat and I had trouble figuring out what was going on with the Hamburgers, and, when we did, we found they had quietly shelved our initiative because of the DFG opposition.

Such is the stuff conservation leadership is too often made of

To be fair, not all the opposition came from the fish bureaucrats. Earl Carpenter of Bodega Bay was still regarded as ‘the Captain’ of CA’s commercial salmon fishing fleet and he growled ‘you’re going to be sorry as hell if you succeed – you’re going to find there’s a hell of a lot more naturals out there than you think. ‘Would that it were so!

In those days Jim Martin (cc-ed here), then ODF&W’s fisheries chief was pushing hard – and successfully - for what is now the NW’s universal hatchery marking/mark-selective salmon fishing regime

Fishing with Jim on the Willamette last year for spring salmon (the mainstem Columbia was closed) I tied into a beauty which took me several minutes to crank up close enough to the boat to see the ad fin. It was an absolutely huge, gorgeous fish and my heart filled, frankly, for the opportunity to turn it loose, hopefully to produce more lunkers like him/her

I'm still wrapped around one of the assignments that the visionary Nat Bingham – who's been gone 14 years now – gave me, and that's boosting, however I can, genetic stock identification (see, e.g., <http://www.pacificfishtrax.org/media/2paggers/Genetics%20CROOS%20Summary%201Jan10.pdf>)

Hopefully, between the two technologies – mark-selective fishing and GSI – we can pass salmon on to the next seven generations

Bill Kier

Kier Associates, Fisheries and Watershed Professionals  
P.O. Box 915  
Blue Lake, CA 95525  
(707) 668-1822  
Mobile: 707.498.7847  
[www.kierassociates.net](http://www.kierassociates.net)  
GSA Contractor GS10F0124U

**From:** [env-trinity-bounces@velocipede.dcn.davis.ca.us](mailto:env-trinity-bounces@velocipede.dcn.davis.ca.us) [<mailto:env-trinity-bounces@velocipede.dcn.davis.ca.us>] **On Behalf Of** Tom Stokely  
**Sent:** Friday, July 27, 2012 8:22 PM  
**To:** [env-trinity@velocipede.dcn.davis.ca.us](mailto:env-trinity@velocipede.dcn.davis.ca.us)  
**Subject:** [env-trinity] Fwd: CBB: Study Analyzes Benefits Of 'Mark-Selective' Fishing For Wild Salmon Populations

**From:** "Sari Sommarstrom" <[REDACTED]@[REDACTED]>  
**Date:** July 27, 2012 6:16:01 PM PDT  
**To:** "Trinity River e-news" <[env-trinity@velocipede.dcn.davis.ca.us](mailto:env-trinity@velocipede.dcn.davis.ca.us)>  
**Cc:** "Tom\_Stokely" <[tstokely@att.net](mailto:tstokely@att.net)>  
**Subject:** CBB: Study Analyzes Benefits Of 'Mark-Selective' Fishing For Wild Salmon Populations

THE COLUMBIA BASIN BULLETIN:

Weekly Fish and Wildlife News

[www.cbbulletin.com](http://www.cbbulletin.com)

July 27, 2012

Issue No. 630

### Study Analyzes Benefits Of 'Mark-Selective' Fishing For Wild Salmon Populations

A fish marking practice commonly used in Washington and Oregon could significantly increase wild salmon populations in California, while allowing continued harvest of abundant hatchery populations, according to a recent study published in Marine and Coastal Fisheries.

The article, first published June 18, is authored by Brian J. Pyper of Cramer Fish Sciences and Fish Metrics, Steven P. Cramer of Cramer Fish Sciences and Randolph P. Ericksen of Cramer Fish Sciences and the Wild Salmon Center.

California wild chinook salmon populations, including several populations that are protected under the Endangered Species Act, have declined over the past decades. This has led to increased management restrictions on commercial and recreational fisheries, as well as increased reliance on hatchery-raised fish to support those fisheries.

In Oregon and Washington, nearly all hatchery salmon produced for harvest receive a visible mark, while wild salmon remain unmarked and are therefore easily identified in ocean and river fisheries. When adult salmon are caught, marked hatchery salmon are kept, while unmarked wild salmon in most cases must be released back to the ocean or river.

This practice of “mark-selective fishing” has enabled many salmon fisheries in Oregon and Washington to continue despite serious concerns for the abundance of wild salmon, according to the recently published study. As an example naturally produced fish from a total of 13 salmon and steelhead stocks originating in the Columbia River basin are protected from non-tribal harvest.

Although California has not adopted this practice, the new study suggests that mark-selective fishing could result in substantial increases in wild salmon populations while maintaining important harvest opportunities, the research paper says.

“A harvest strategy that targets hatchery salmon over wild salmon makes sense when hatchery salmon are plentiful but are mixed with depleted wild populations” said Steve Cramer, founding scientist of the consulting firm Cramer Fish Sciences, and co-author of the publication. “If wild salmon populations in California continue to struggle and we do not find a solution that enables targeted capture of hatchery fish while allowing wild fish to escape, then it is likely that salmon fishing in California will be increasingly constrained to low levels.”

The study used data on the actual abundance and harvest of chinook salmon in northern California’s Central Valley and the ocean off California over two decades (1988-2007) to examine how mark-selective fishing regulations would have affected harvest and spawner abundance.

The study showed that selective fishing could have, if applied to past fishing seasons, doubled the number of wild salmon in California rivers. At the same time, it would have allowed substantial harvests of hatchery fish, depending on the proportion of salmon that were of hatchery origin.

The key results of the study applied to recent years (2001-2007) in which ocean fisheries were constrained to protect weak wild populations.

“We examined a range of plausible scenarios of fishing effort and hatchery salmon abundance,” Cramer explained. “When 60 percent or more of the salmon are from hatcheries, the mark-selective scenarios generally allowed for higher total harvests of salmon and modest increases in wild populations compared to the traditional regulations that were in place to constrain harvest and protect wild fish.”

The study cited other research that estimated hatchery fish have composed as high as 90 percent of chinook off California in recent years.

About 35 million juvenile chinook are released each year from Central Valley hatcheries, but most of these fish are unmarked.

“The high cost of marking all hatchery fish, and the challenge of working out new methods to estimate catch-and-release mortality of wild salmon has hindered fisheries agencies in California from implementing mark-selective fisheries,” Cramer said. “Despite these challenges, the results of our study suggest that serious consideration and evaluation of mark-selective fisheries for California salmon are warranted.”

The full study, “Implications of Mark-Selective Fishing for Ocean Harvests and Escapements of Sacramento River Fall Chinook Salmon Populations,” can be found here: <http://www.tandfonline.com/doi/pdf/10.1080/19425120.2012.679575>

**From:** Jason Peltier

**Sent:** Friday, August 3, 2012 7:37 AM

**To:** 'Karen Clark'; 'Alison MacLeod'; 'Carmela McHenry'; 'Carolyn Jensen'; 'Catherine Karen'; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Joe Findaro'; 'Mike Burns'; 'Susan Ramos'; 'Tony Coelho'; T Birmingham

**Subject:** PBS link

[http://www.pbs.org/newshour/bb/science/july-dec12/waterwar\\_08-02.html](http://www.pbs.org/newshour/bb/science/july-dec12/waterwar_08-02.html)

**From:** Jason Peltier

**Sent:** Friday, August 3, 2012 9:54 AM

**To:** 'Alison MacLeod'; 'Carmela McHenry'; 'Carolyn Jensen'; 'Catherine Karen'; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Jason Peltier'; 'Joe Findaro'; 'Mike Burns'; 'Susan Ramos'; 'Tony Coelho'; T Birmingham

**Subject:** FW: Laird File

**Attachments:** Laird to Boxer and Feinstein 24 July 2012.pdf; Laird to Costa Cardoza 31 July 2012.pdf; Laird to Dial San Joaquin COG 10 July 2012.pdf; laird to San Joaquin County Supes 26 June 2012.pdf

More letters + hard copy of the letter to SJ Council of Govts with Kennedy quote.

Well, in addition to the ones on your email, here is the one to the San Joaquin County COG that some people liked, as well as our response to Feinstein and Boxer, our response to Cardoza and Costa, and an earlier one that went to the San Joaquin County Supes. You saw the incoming letters from the Senators and from Costa and Cardoza.





EDMUND G. BROWN JR., Governor  
JOHN LAIRD, Secretary for Natural Resources

July 24, 2012

The Honorable Dianne Feinstein  
United States Senator  
331 Hart Senate Office Building  
Washington, D.C. 20510

The Honorable Barbara Boxer  
United States Senator  
112 Hart Senate Office Building  
Washington, D.C. 20510

Dear Senators Feinstein and Boxer,

Thank you for your recent letter of support for the Bay Delta Conservation Plan (BDCP) and for your continued encouragement of our efforts to fulfill the promise of the co-equal goals of Delta restoration and a reliable water supply for California. It has taken six years of open, collaborative debate and intensive scientific research and analysis to reach this next critical juncture for BDCP. We have been rewarded with a much deeper understanding of the needs of the Delta as well as a popular and scientific consensus on the need to protect our water supplies that is far broader than any of us could have imagined just a few years ago. That consensus is constantly growing. We could never have accomplished this much without your leadership and support. We will need your help more than ever as we move into this next phase of formal environmental review and permitting.

Sincerely,

A handwritten signature in black ink that reads "John Laird". The signature is fluid and cursive.

John Laird  
Secretary for California Natural Resources

1416 Ninth Street, Suite 1311, Sacramento, CA 95814 Ph. 916.653.5656 Fax 916.653.8102 <http://resources.ca.gov>

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Energy Resources, Conservation & Development Commission • Native American Heritage Commission • Sacramento-San Joaquin Delta Conservancy • San Diego River Conservancy  
San Francisco Bay Conservation & Development Commission • San Gabriel & Lower Los Angeles Rivers & Mountains Conservancy • San Joaquin River Conservancy  
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July 31, 2012

**EDMUND G. BROWN JR., Governor**  
**JOHN LAIRD, Secretary for Natural Resources**

Congressman Jim Costa  
1314 Longworth HOB  
Washington, DC 20515

Congressman Dennis Cardoza  
2437 Rayburn Building  
Washington, DC 20515

Dear Honorable Congressman Costa and Congressman Cardoza,

Thank you for your letter encouraging our efforts on BDCP. As you know, I have always appreciated your continuing support and counsel and I take your "finer point" very much to heart.

There are several factors that I think will help us all to find that crucial balance point that you describe. The first is the extraordinary breadth and depth of the hundreds of people working on BDCP. I understand your concern about not relying exclusively on the recommendations of the technical staff. But one of the great things about the collaborative process which has been shaping BDCP is that it reaches so far beyond the important technical sciences to include experts from other agencies in many different disciplines. Our work together benefits as much from the visionaries as from the scientists.

Another important resource that will play an even larger role I hope in the months to come lies in the quality of the research we're underwriting for Dr. David Sunding to examine the value of the benefits that BDCP will produce. The results of his work are not yet final. But his recent presentation to a public meeting on BDCP made it clear that the benefits of a more reliable water supply are real, measurable and potentially very substantial.

Moreover nobody does more to help us find that critical balance point than the legions of people who have concerns about BDCP. I'm thinking here of those who oppose the project as well as those who don't think the plan goes far enough, and all the gradations of criticism that lie in between. This is where transparency and our commitment to an open process of participation and review really pay off. If we are tilting too far one way or another, I can always count on hearing about it, quickly and emphatically.

The recent joint appearance of Governor Brown and Secretary Salazar in Sacramento has given another important boost to our efforts to address California's water crisis. That event marked the closing of an important chapter in BDCP's development. Just as important, as Secretary Salazar said, it affirmed that the state and federal governments are working as one in addressing these issues. I do not think we could have achieved this measure of unity of purpose without the consistent support you both have provided.

Sincerely,

A handwritten signature in dark ink, appearing to read "John Laird".

John Laird  
Secretary for Natural Resources

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EDMUND G. BROWN JR., Governor  
JOHN LAIRD, Secretary for Natural Resources

July 10, 2012

Mr. Steven Dial  
Deputy Executive Director/Chief Financial Officer  
San Joaquin Council of Governments  
555 E. Weber Avenue  
Stockton, California 95202

Dear Mr. Dial:

Thank you for your letter calling for various issues to be resolved in advance of any further progress on the Bay Delta Conservation Plan (BDCP) or the Delta Stewardship Council's Delta Plan.

As you may know, next month marks the 50th anniversary of the groundbreaking for construction of the San Luis Unit, which is an essential link for both the federal Central Valley Project and the State Water Project. I mention it because your letter reminded me of something President John F. Kennedy said when he attended that event.

The president pointed out, "In this project one part of your state has been willing to help another part because they realize that as this state does well, so does the United States. Nothing could be more disastrous for this country than for the citizens of one part of the state to feel that everything they have is theirs and that it should not be shared with the other citizens of this state. That is the way to stand still."

The San Luis Unit today helps to supply water to the homes and businesses of more than 25 million Californians. It helps us to supply nearly half of America's fresh fruits and vegetables. It has created countless thousands of jobs throughout California, including in San Joaquin County.

BDCP likewise promises to make a major contribution toward resolving California's current water crisis. Moreover, no county stands to benefit more than San Joaquin County from the development of the new water facilities proposed in BDCP. It would create tens of thousands of construction-related jobs in San Joaquin County alone at a time when Stockton is facing bankruptcy and the local economy desperately needs relief.

Responding to specific issues you raised, I offer the following:

While both the benefits and costs of BDCP must be considered, it is important to note that it is very hard to quantify the financial benefits of protecting and restoring rare and endangered species. But saving those species furthers the co-equal goals established by the Legislature.

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July 10, 2012  
Page 2

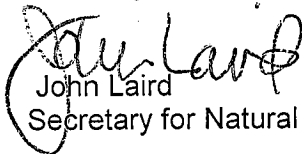
In the final analysis, each local water agency will have to determine whether to invest in solutions suggested by BDCP. The economic impact on the Delta will have to also be considered, but the jobs analysis alone suggests a positive economic impact.

The BDCP EIR/S will consider all water quality aspects of the project. It will also consider all water supply elements over a long period of hydrologic record.

The State Water Resources Control Board will determine public trust values in their update of the Basin Plan, and when considering any proposal for change in point of diversion.

We are prepared to work with responsible leaders in local government who are seriously interested in resolving them. The one thing that is absolutely certain is that unwavering opposition to California's efforts to solve the water crisis is not in anyone's better interest. San Joaquin County cannot benefit from it. California's economy cannot sustain it. And the Delta cannot survive it.

Sincerely,

A handwritten signature in dark ink, appearing to read "John Laird", is written over the typed name.

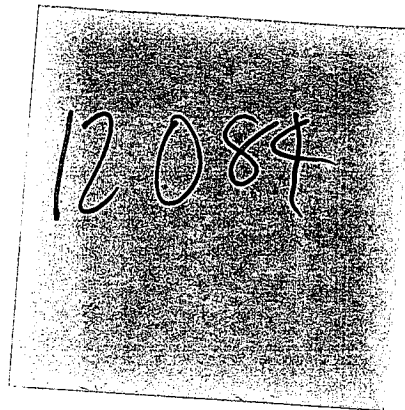
John Laird  
Secretary for Natural Resources



EDMUND G. BROWN JR., Governor  
JOHN LAIRD, Secretary for Natural Resources

June 26, 2012

Mr. Steve Bestolarides  
Chairman, Board of Supervisors  
San Joaquin County  
44 N. San Joaquin Street Suite 627  
Stockton, California 95202



Dear Mr. Bestolarides:

Thank you for your letter inquiring about the status and direction of the Bay Delta Conservation Plan (BDCP). Let me reassure you at the outset that I am confident Dr. Meral's presentation to your board was accurate in all its particulars. Certainly you should not be concerned that there is any difference between us with respect to the significant changes we are considering for BDCP.

The adjustments we are reviewing with the other participating federal, state and local agencies would enhance protections for the environment, accelerate the opportunities for species recovery, and minimize the impacts of construction on the Delta counties.

San Joaquin County would be one of the primary beneficiaries of BDCP's development. According to the independent analysis of the project's impact on employments, just in the years immediately ahead, BDCP will create tens of thousands of construction-related jobs in San Joaquin County at a time when the local economy desperately needs them.

Over the longer term, your constituents will benefit from improved water quality, a richer mix of recreational opportunities, habitat and other environmental enhancements, higher standards of agricultural management and production, and all of the other economic benefits that will flow from sustained investments in public infrastructure and all of the private businesses that it will support.

I have the greatest respect for your concerns about the project and your responsibility to ensure that San Joaquin County will benefit from BDCP's development. But let's be clear. We cannot turn our backs on the needs of the 25 million Californians who depend on the water supplies that are pumped through the Delta. Continued intransigence, complacency and inaction rank among the greatest threats to the Delta's future.

My point is that there is much we could accomplish working together. San Joaquin County can play an important role as part of the solution to California's water crisis.

Sincerely,

John Laird  
Secretary for Natural Resources

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San Francisco Bay Conservation & Development Commission • San Gabriel & Lower Los Angeles Rivers & Mountains Conservancy • San Joaquin River Conservancy  
Santa Monica Mountains Conservancy • Sierra Nevada Conservancy • State Lands Commission • Wildlife Conservation Board



**From:** Jason Peltier  
**Sent:** Monday, August 6, 2012 1:30 PM  
**To:** Joe Findaro; David Bernhardt  
**Subject:** Fwd: Google Alert - Westlands water district

Begin forwarded message:

**From:** Google Alerts <[googlealerts-noreply@google.com](mailto:googlealerts-noreply@google.com)>  
**Date:** August 6, 2012 12:58:40 PM PDT  
**To:** [jpeltier@westlandswater.org](mailto:jpeltier@westlandswater.org)  
**Subject:** Google Alert - Westlands water district

News

1 new result for **Westlands water district**

[McNerney, Gill fling political dirt over Delta tunnels](#)

Stockton Record

His campaign fired back at Gill, revealing that the Lodi candidate received a campaign contribution from a farm-oriented political action committee with ties to the **Westlands Water District**, a primary tunnel supporter. Said Lauren Smith, McNerney's ...

[See all stories on this topic »](#)

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**From:** Stefanie Morris  
**Sent:** Friday, August 10, 2012 2:01 PM  
**To:** 'Sheehan,Rebecca D'; 'Sheila Greene'; 'Linda Standlee'  
**Subject:** Emailing: Poff%20eloha%2009.pdf  
**Attachments:** Poff%20eloha%2009.pdf

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# The ecological limits of hydrologic alteration (ELOHA): a new framework for developing regional environmental flow standards

N. LEROY POFF\*, BRIAN D. RICHTER<sup>†</sup>, ANGELA H. ARTHINGTON<sup>‡</sup>, STUART E. BUNN<sup>‡</sup>, ROBERT J. NAIMAN<sup>§</sup>, ELOISE KENDY<sup>¶</sup>, MIKE ACREMAN<sup>\*\*</sup>, COLIN APSE<sup>††</sup>, BRIAN P. BLEDSOE<sup>‡‡</sup>, MARY C. FREEMAN<sup>§§</sup>, JAMES HENRIKSEN<sup>¶¶</sup>, ROBERT B. JACOBSON<sup>\*\*\*</sup>, JONATHAN G. KENNEN<sup>†††</sup>, DAVID M. MERRITT<sup>‡‡‡</sup>, JAY H. O'KEEFE<sup>§§§</sup>, JULIAN D. OLDEN<sup>¶¶¶</sup>, KEVIN ROGERS<sup>\*\*\*\*</sup>, REBECCA E. THARME<sup>††††</sup> AND ANDREW WARNER<sup>‡‡‡‡</sup>

\*Department of Biology & Graduate Degree Program in Ecology, Colorado State University, Fort Collins, CO, U.S.A.

<sup>†</sup>The Nature Conservancy, Charlottesville, VA, U.S.A.

<sup>‡</sup>Australian Rivers Institute and eWater Cooperative Research Centre, Griffith University, Brisbane, Qld, Australia

<sup>§</sup>School of Aquatic & Fishery Sciences, University of Washington, Seattle, WA, U.S.A.

<sup>¶</sup>The Nature Conservancy, Helena, MT, U.S.A.

<sup>\*\*</sup>Centre for Ecology and Hydrology, Wallingford, U.K.

<sup>††</sup>The Nature Conservancy, Brunswick, ME, U.S.A.

<sup>‡‡</sup>Department of Civil and Environmental Engineering, Colorado State University, Fort Collins, CO, U.S.A.

<sup>§§</sup>Patuxent Wildlife Research Center, U.S. Geological Survey, Athens, GA, U.S.A.

<sup>¶¶</sup>U.S. Geological Survey, Fort Collins, CO, U.S.A.

<sup>\*\*\*</sup>Columbia Environmental Research Center, U.S. Geological Survey, Columbia, MO, U.S.A.

<sup>†††</sup>U.S. Geological Survey, West Trenton, NJ, U.S.A.

<sup>‡‡‡</sup>USDA Forest Service, Watershed, Fish, and Wildlife, Fort Collins, CO, U.S.A.

<sup>§§§</sup>Department of Environmental Resources, UNESCO-IHE Institute for Water Education, Delft, The Netherlands

<sup>¶¶¶</sup>School of Aquatic & Fishery Sciences, University of Washington, Seattle, WA, U.S.A.

<sup>\*\*\*\*</sup>University of the Witwatersrand, Johannesburg, South Africa

<sup>††††</sup>International Water Management Institute, Colombo, Sri Lanka

<sup>‡‡‡‡</sup>The Nature Conservancy, University Park, Pennsylvania, PA, U.S.A.

## SUMMARY

1. The flow regime is a primary determinant of the structure and function of aquatic and riparian ecosystems for streams and rivers. Hydrologic alteration has impaired riverine ecosystems on a global scale, and the pace and intensity of human development greatly exceeds the ability of scientists to assess the effects on a river-by-river basis. Current scientific understanding of hydrologic controls on riverine ecosystems and experience gained from individual river studies support development of environmental flow standards at the regional scale.

2. This paper presents a consensus view from a group of international scientists on a new framework for assessing environmental flow needs for many streams and rivers simultaneously to foster development and implementation of environmental flow standards at the regional scale. This framework, the ecological limits of hydrologic alteration (ELOHA), is a synthesis of a number of existing hydrologic techniques and environmental flow methods that are currently being used to various degrees and that can support comprehensive regional flow management. The flexible approach allows

---

Correspondence: N. LeRoy Poff, Department of Biology, Colorado State University, Fort Collins, 80523 CO, U.S.A.

E mail: poff@lamar.colostate.edu

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scientists, water-resource managers and stakeholders to analyse and synthesise available scientific information into ecologically based and socially acceptable goals and standards for management of environmental flows.

3. The ELOHA framework includes the synthesis of existing hydrologic and ecological databases from many rivers within a user-defined region to develop scientifically defensible and empirically testable relationships between flow alteration and ecological responses. These relationships serve as the basis for the societally driven process of developing regional flow standards. This is to be achieved by first using hydrologic modelling to build a 'hydrologic foundation' of baseline and current hydrographs for stream and river segments throughout the region. Second, using a set of ecologically relevant flow variables, river segments within the region are classified into a few distinctive flow regime types that are expected to have different ecological characteristics. These river types can be further subclassified according to important geomorphic features that define hydraulic habitat features. Third, the deviation of current-condition flows from baseline-condition flow is determined. Fourth, flow alteration–ecological response relationships are developed for each river type, based on a combination of existing hydroecological literature, expert knowledge and field studies across gradients of hydrologic alteration.

4. Scientific uncertainty will exist in the flow alteration–ecological response relationships, in part because of the confounding of hydrologic alteration with other important environmental determinants of river ecosystem condition (e.g. temperature). Application of the ELOHA framework should therefore occur in a consensus context where stakeholders and decision-makers explicitly evaluate acceptable risk as a balance between the perceived value of the ecological goals, the economic costs involved and the scientific uncertainties in functional relationships between ecological responses and flow alteration.

5. The ELOHA framework also should proceed in an adaptive management context, where collection of monitoring data or targeted field sampling data allows for testing of the proposed flow alteration–ecological response relationships. This empirical validation process allows for a fine-tuning of environmental flow management targets. The ELOHA framework can be used both to guide basic research in hydroecology and to further implementation of more comprehensive environmental flow management of freshwater sustainability on a global scale.

*Keywords:* environmental flows, hydroecology, hydrologic modelling, river management, streamflow classification

## Introduction

Water managers the world over are increasingly challenged to provide reliable and affordable water supplies to growing human populations. At the same time, local communities are expressing concern that water development should not degrade freshwater ecosystems or disrupt valued ecosystem services, such as the provision of fish and other sources of food and fibre as well as places for recreation, tourism and other cultural activities (Postel & Carpenter, 1997; Naiman *et al.*, 2002; Dyson, Bergkamp & Scanlon, 2003; Postel & Richter, 2003). Aquatic ecosystems

support our livelihoods, life styles and ethical values (Acreman, 2001). While people need water directly for drinking, growing food and supporting industry, water for ecosystems often indirectly equates to water for people (Acreman, 1998). There is a fundamental need to address ecological requirements and optimise social well-being across a broad array of water needs to attain sustainability in the management and allocation of water (Gleick, 2003; *Millennium Ecosystem Assessment*, 2003, 2005). Deliberate and strategic design of resilient ecosystems, including freshwaters, is now recognised as a major social-scientific challenge of the 21st century (Palmer *et al.*, 2004).

Environmental flows are defined in the Brisbane Declaration (<http://www.riverfoundation.org.au/images/stories.pdf/bdeclaration.pdf>) as the 'quantity, timing and quality of water flows required to sustain freshwater and estuarine ecosystems and the human livelihood and well-being that depend on these ecosystems'. It is now widely accepted that a naturally variable regime of flow, rather than just a minimum low flow, is required to sustain freshwater ecosystems (Poff *et al.*, 1997; Bunn & Arthington, 2002; Postel & Richter, 2003; Annear *et al.*, 2004; Biggs, Nikora & Snelder, 2005; Poff, 2009), and this understanding has contributed to the implementation of environmental flow management on thousands of river kilometres worldwide (Postel & Richter, 2003). Despite this tangible progress, millions of kilometres of river and thousands of hectares of wetlands (and the human livelihoods dependent upon them) remain unprotected from the threat of over-allocation of water to offstream uses or to other alterations of the natural flow regime. These threats will only continue to increase with projected growth in the human population and its associated demand for energy, irrigated food production and industrial use (CAWMA 2007), and with uncertainties associated with climate change (Vörösmarty *et al.*, 2000; Dudgeon *et al.*, 2006; Palmer *et al.*, 2008). As water development plans are being formulated to provide greater water security and other social benefits, it will be critically important to ensure that the considerable socioeconomic benefits already provided by healthy freshwater ecosystems are not lost and that degraded ecosystems be restored.

A sense of urgency has arisen for the need to develop ecological goals and management standards that can be applied globally to streams and rivers across a spectrum of ecological, social, political and governance contexts, regardless of the current stage of water-resource development. The imperative to incorporate ecosystem needs for fresh water into basin-wide and regional water-resources planning is increasingly recognised at national and international scales (Petts, 1996; Dyson *et al.*, 2003; GWSP, 2005; NSTC, 2004; CAWMA, 2007; Brisbane Declaration, <http://www.riverfoundation.org.au/images/stories.pdf/bdeclaration.pdf>). Unfortunately, the pace and intensity of flow alteration in the world's rivers greatly exceeds the ability of scientists to assess the effects on a river-by-river basis – this despite

notable scientific progress in the last decade in developing environmental flow methods for river-specific applications (Brown & Joubert, 2003; Tharme, 2003; Annear *et al.*, 2004; Arthington *et al.*, 2004; King & Brown, 2006). Thus, a key challenge in securing freshwater ecosystem sustainability is synthesising the knowledge and experience gained from individual case studies into a scientific framework that supports and guides the development of environmental flow standards at the *regional* scale (Poff *et al.*, 2003; Arthington *et al.*, 2006), i.e. for states, provinces, large river basins or even entire countries. Defining environmental flow standards for many rivers simultaneously, including those for which little hydrologic or ecological information exists, is necessary for water managers to effectively integrate human and ecosystem water needs in a timely and comprehensive manner (Arthington *et al.*, 2006).

In this paper, we present a consensus view from a group of international scientists on a new framework for assessing environmental flow needs that we believe can form the basis for developing and implementing environmental flow standards at the regional scale. This consensus reflects our experiences and knowledge of the science of environmental flows gained through both scientific research and practical applications. We refer to this framework as the 'ecological limits of hydrologic alteration' or ELOHA. Our goal is to present a logical approach that flexibly allows scientists, water-resource managers and other stakeholders to analyse and synthesise available scientific information into coherent, ecologically based and socially acceptable goals and standards for management of environmental flows. This presentation of the ELOHA framework focuses primarily on the scientific approaches and challenges of providing the best possible information regarding the range of ecological consequences that will result from different levels of flow modification at a regional scale. We deliberately provide only cursory treatment of the social and policy challenges inherent in gaining adoption of water management goals and implementation of environmental flow standards consistent with those goals. We expect that other authors with expertise in water policy and the social sciences will offer their perspectives on the need for, and challenges associated with, effectively implementing the ELOHA framework in a variety of social and governance contexts.

### Historical scientific foundations of the ELOHA framework

The protocol for regional environmental flow assessment described in this paper is grounded in several recent and important scientific advances. First, research over the last few decades has amply demonstrated that ecological and evolutionary processes in river ecosystems are heavily influenced by many facets of a dynamic, historical flow regime (reviewed in Poff *et al.*, 1997; Bunn & Arthington, 2002; Lytle & Poff, 2004). Indeed, streamflow has been called the 'master variable' (Power *et al.*, 1995), or the 'maestro...that orchestrates pattern and process in rivers' (Walker, Sheldon & Puckridge, 1995). Much evidence also exists that modifications of streamflow induce ecological alterations (reviewed in Bunn & Arthington, 2002; Poff & Zimmerman, 2009). Thus, both ecological theory and abundant evidence of ecological degradation in flow-altered rivers support the need for environmental flow management. Certainly, environmental factors other than streamflow (including temperature, water quality, sediment and invasive species) also regulate riverine ecosystem structure and function, as has been well recognised (e.g. Poff *et al.*, 1997; Baron *et al.*, 2002; Dudgeon *et al.*, 2006). A fuller accounting of the interactions between flow and these other environmental features remains a challenge for advancing the science of environmental flows (and this is discussed more fully below); however, we argue that our present scientific understanding of the role of flow alteration in modifying ecological processes justifies the development of regional flow standards to underpin river restoration and conservation. At a minimum, as society struggles to conserve and restore freshwater ecosystems, flow management is needed to ensure that existing ecological conditions do not decline further (Palmer *et al.*, 2005).

A second scientific foundation supporting ELOHA is the extensive development and application of environmental flow methods globally (see Tharme, 2003; Acreman & Dunbar, 2004). These methods, along with the development of hundreds of ecologically relevant flow metrics and techniques for quantifying human-caused flow and ecological alteration (Richter *et al.*, 1996; Puckridge *et al.*, 1998; Olden & Poff, 2003; Arthington *et al.*, 2004, 2007; Kennen, Henriksen & Nieswand, 2007; Mathews & Richter,

2007), provide a rich toolbox for environmental flow science. Many of these methods and tools can be directly applied or readily adapted for use in regional environmental flow assessment.

Third, the conceptual foundation now exists to facilitate regional environmental flow assessments. By classifying rivers according to ecologically meaningful streamflow characteristics (e.g. Poff & Ward, 1989; Harris *et al.*, 2000; Henriksen *et al.*, 2006), groups of similar rivers can be identified, such that within a grouping or type of river there is a *range* of hydrologic and ecological variation that can be considered the natural variability for that type. Arthington *et al.* (2006) argued that empirical relationships describing ecological responses to flow regime alteration within river flow types should form the basis of flow management for both river ecosystem protection (proactive flow management) and sustainable restoration (reactive flow management). This perspective represents a major advance by bridging the gap between the simplistic and often arbitrary hydrologic 'rules of thumb' presently being used for regional-scale estimation of environmental flow needs and, at the other extreme, the detailed and often expensive environmental flow assessments being applied on a river-by-river basis.

Fourth, developing and implementing environmental flow standards at regional scales ultimately requires employing hydrologic models that can provide reasonably accurate estimates of ecologically meaningful streamflows in rivers or river segments distributed throughout a region, including those lacking streamflow gauging records (e.g. Snelder, Biggs and Wood, 2005; Kennen *et al.*, 2008). Hydrologic models can be used to evaluate the nature and degree of hydrologic alteration resulting from human activities and to anticipate the degree to which proposed human activities may further alter the hydrologic regime. With modelled hydrographs, all river segments can be classified hydrologically and ecological information collected from ungauged locations can be used to support the development of relationships between flow alteration and ecological degradation.

Finally, contemporary scientific understanding acknowledges that river management involves complex, coupled social-ecological systems (Rogers, 2006) and if science is to contribute to sustainable water and ecosystem management, it must become engaged in collaborative processes with managers and other

stakeholders to illustrate alternative river visions and to help define pathways to achieve socially desirable goals (Poff *et al.*, 2003). The complexity of river systems generates uncertainty in their response to many types of management actions (including flow manipulation); therefore, scientists must be willing to articulate an adaptive learning cycle that uses the best-available science to set ecosystem management goals and then uses monitoring to improve understanding of ecological responses to management actions. Ultimately, this approach will allow future management actions to be fine-tuned (Arthington & Pusey, 2003; King, Brown & Sabet, 2003; Richter *et al.*, 2006; Rogers, 2006) and hopefully sustained.

We present the ELOHA framework as a synthesis of a number of existing hydrologic techniques and environmental flow methods that are currently being used to various degrees and that can support comprehensive regional flow management. Many of the basic elements of the framework presented here are now being implemented in a variety of geographical settings and political jurisdictions around the world. As products and summaries of these early ELOHA applications become available, and pertinent tools and techniques useful in ELOHA are described in greater detail, they will be posted at: <http://conserveonline.org/workspaces/eloha>.

### The scientific process in the ELOHA framework

The ELOHA framework involves a number of interconnected steps, feedback loops and iterations

(Fig. 1). Relationships between flow alteration and ecological characteristics for different river types constitute the key element that links the hydrologic, ecological and social aspects of environmental flow assessment. These relationships are based on paired streamflow and ecological data from throughout the region of interest. Our description of the ELOHA framework is presented in stepwise fashion, recognising that various scientific and social processes will likely proceed simultaneously and many need to be repeated iteratively.

The scientific process consists of four major steps, each with a number of technical components, building upon the approach recommended in Arthington *et al.* (2006). It is our express intent to provide considerable flexibility in the selection of particular input data, tools or analytical methods for accomplishing each step. A risk-based approach is encouraged, which involves choosing the most appropriate model through a trade-off between avoiding the unnecessary expense and effort of developing highly detailed and data-hungry models (often applicable at site-specific scales), while generating information and products containing sufficient certainty to support decisions at broad regional scales (Acreman & Dunbar, 2004; Booker & Acreman, 2007). Such a risk-based approach may be initiated in many regions by investing in simple tools and using readily available data, then moving to more complex and expensive approaches, including additional data collection as the need for prediction resolution increases.

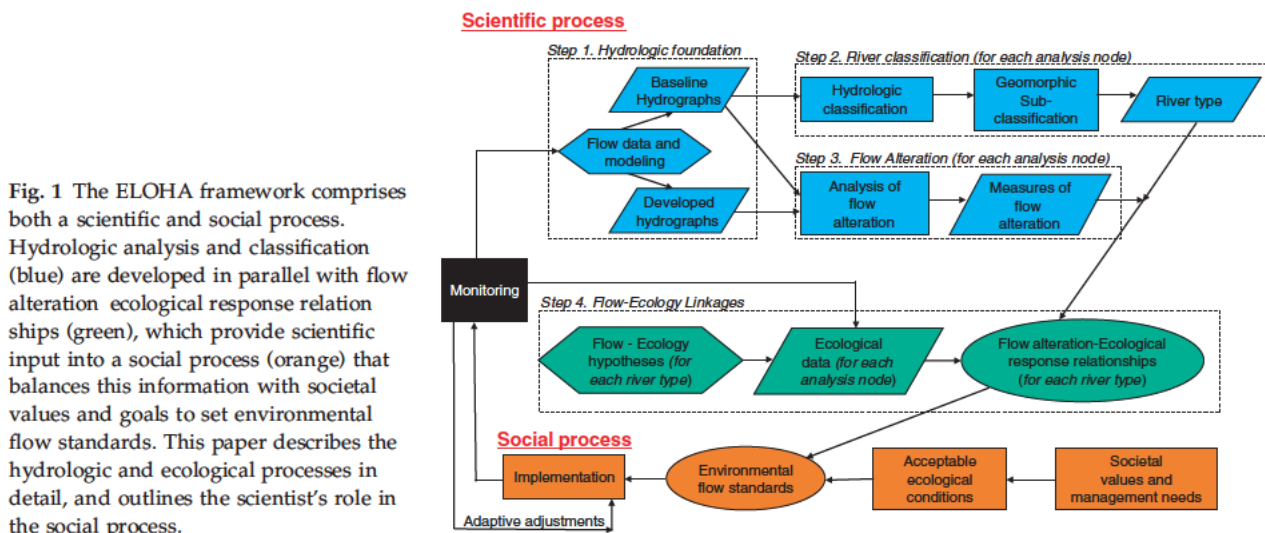


Fig. 1 The ELOHA framework comprises both a scientific and social process. Hydrologic analysis and classification (blue) are developed in parallel with flow alteration ecological response relationships (green), which provide scientific input into a social process (orange) that balances this information with societal values and goals to set environmental flow standards. This paper describes the hydrologic and ecological processes in detail, and outlines the scientist's role in the social process.



### Building a hydrologic foundation

A key feature of the ELOHA framework is a hydrologic database that describes flow regimes not just in 'traditional' anthropocentric terms, such as average yield or reliability, but also in terms known to be linked to ecological outcomes (described below). Hydrologic modelling is used to create the hydrographs that form the 'hydrologic foundation', which consists of two comprehensive databases of daily (or possibly longer time steps such as weekly or monthly) flow time-series representing simulated baseline and developed conditions throughout the region during a common time period. Baseline conditions refer to minimally altered or best-available conditions (the 'reference-site approach', *sensu* Stoddard *et al.*, 2006), whereas developed conditions refer to altered flow regimes associated with both the direct (e.g. water-resource development) and indirect (e.g. land use change) effects of human activities.

The hydrologic foundation serves several important purposes. First, it facilitates the use of ecological information collected throughout the region, thereby expanding the number of sites that can be used in developing flow alteration–ecological response relationships beyond only those sites having streamflow gauges. Second, it provides a basis for comparing present-day flow regimes to baseline conditions, i.e. those that served as the template for recent evolution of native species and for shaping ecosystem processes, as well as sociocultural dependencies upon those ecological conditions and processes. Third, it enhances the ability of water managers and planners to understand the cumulative impacts of hydrologic alteration that have already taken place across the region, so that those alterations can be linked to observed changes in ecological conditions and ecosystem services as a basis for forecasting future ecological change in the context of regional water management planning. In a similar vein, the foundation can be combined with other regional environmental information (e.g. non-point pollution sources on agricultural lands) to generate landscape characterisations of management interest.

The coupled baseline and developed hydrologic time-series constituting the hydrologic foundation should be developed for all locations in the region where water management decisions, including environmental flow protection, are needed or anticipated.

These 'analysis nodes' should be identified in close collaboration with water managers who will use the hydrologic foundation to understand and manage water allocation and environmental flows. The baseline and developed-condition hydrographs serve as independent variables in developing flow alteration–ecological response relationships (described in Formulating flow alteration–ecological response relationships for environmental flows below). Therefore, analysis nodes should also be established for all sites at which ecological data to be used in flow alteration–ecological response relationships have been collected or are likely to be collected and they should include the range of geomorphic features at the river segment scale that mediate how habitat availability and diversity are expressed for a given flow regime. All of this information should be stored in a relational database and imported into a geographic information system (GIS) to enable users to easily access hydrographs and associated flow statistics.

Figure 2 illustrates the general approach for building the regional hydrologic foundation. Briefly, the approach relies on region-specific combinations of streamflow gauge analysis and hydrologic modelling. Existing streamflow gauge records for a selected time period are segregated into those that represent baseline conditions and those that represent developed conditions. Differences between baseline and developed conditions are characterised in terms of

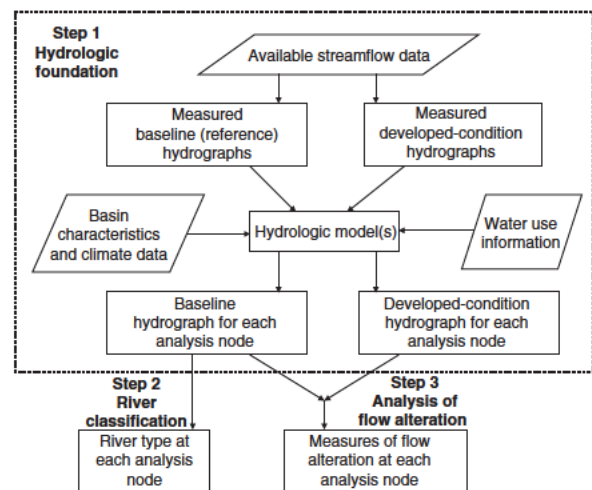


Fig. 2 Steps for developing the hydrologic foundation (ELOHA step 1 inside dashed box), showing how the resulting hydrographs are used to classify river types (ELOHA step 2) and calculate flow alteration (ELOHA step 3) at each analysis node.

statistical departures in the ecologically relevant components of the two flow regimes. At ungauged analysis nodes and for time periods not represented in the period of record, statistical techniques (Sanborn & Bledsoe, 2006; Stuckey, 2006; Zhang *et al.*, 2008; Carlisle *et al.*, 2009) can be used to estimate flow metrics, or hydrologic simulation models of rainfall-runoff and other catchment processes (Singh & Woolhiser, 2002; Wagener, Wheeler & Gupta, 2004; Blöschl, 2005; Kennen *et al.*, 2008) can be developed to generate flow time-series from which metrics can be extracted. In heavily modified catchments, simulation models can be especially useful in estimating baseline flow regimes through removal of flow extractions and reservoirs (e.g. Yates *et al.*, 2009), as well as adjusting various model parameters (e.g. infiltration, interception, routing) to represent past land cover conditions (Beighley, Melack & Dunne, 2003). For rapidly changing land uses (e.g. urbanisation), developed-condition hydrographs could be modelled for both existing and alternative future scenarios, including projected climatic regimes. Ideally, daily streamflows will be generated for the hydrologic foundation, as daily data provide appropriate temporal resolution for understanding most ecological responses to flow alteration. However, in cases where daily data cannot be satisfactorily modelled, a coarser grain of resolution such as weekly or monthly hydrographs can provide some ecologically relevant information (see Poff, 1996) and may serve as a starting point for classification.

Given limited availability of streamflow gauging records with which to calibrate estimates of baseline or developed conditions, and given that climate and river runoff vary naturally over annual to decadal time scales (Lins & Slack, 1999; McCabe & Wolock, 2002), it is desirable to adopt a single time period (e.g. 10–20 years) as a climatic reference period for which baseline and developed-condition streamflows are synthesised and modelled. By using a common climatic reference period for each of these two scenarios, human influences on flow regimes can be separated from climatic influences.

The basic data required to develop the hydrologic foundation are now available for most parts of the globe (Kite, 2000), enabling hydrologists to generate a first-cut approximation of the hydrologic foundation in most, if not all, regions. Prediction accuracy is a significant concern, especially in sparsely gauged

regions, but improvements in *a priori* estimation of model parameters based on remotely sensed land-surface characteristics and the development of Bayesian Monte Carlo techniques have significantly improved the accuracy of hydrologic models (Duan *et al.*, 2006; Schaake *et al.*, 2006). An alternative to regionalisation of model parameters to simulate streamflow time series at ungauged locations is regionalisation of streamflow characteristics to generate flow statistics, which allows for explicit estimation of uncertainty (see Zhang *et al.*, 2008). Since the objective of ELOHA is to identify ecologically significant differences in flow regimes between baseline and developed conditions, it is important to quantify apparent differences that arise due to poor model performance and true differences due to water or catchment management. For example, Acreman *et al.* (2009) distinguished model error from true differences between natural flows and impacted flows downstream of dams in the process of defining ecologically significant thresholds of flow alteration for the European Water Framework Directive in the United Kingdom.

#### *Classifying rivers according to flow regimes and geomorphic features*

River classification is a statistical process of stratifying natural variation in measured characteristics among a population of streams and rivers to delineate river types that are similar in terms of hydrologic and other environmental features. The classification can be developed within any 'region' of interest, from those defined by political boundaries to those representing natural biophysical domains, such as physiographic provinces or ecoregions.

River classification serves two important purposes in the ELOHA framework. First, by assigning rivers or river segments to a particular type, relationships between ecological metrics and flow alteration can be developed for an entire river type based on data obtained from a limited set of rivers of that type within the region (Arthington *et al.*, 2006; Poff *et al.*, 2006b). For each river type there is a range of natural hydrologic variation that regulates characteristic ecological processes and habitat characteristics (Lytle & Poff, 2004; Arthington *et al.*, 2006), and that represents the baseline or reference condition against which ecological responses to alteration are measured across

multiple river segments falling along a gradient of hydrologic alteration.

Second, combining the regional hydrologic modeling with a river typology facilitates efficient biological monitoring and research design. Specifically, it is possible to strategically place monitoring sites throughout a region to capture the range of ecological responses across a gradient of hydrologic alteration for different river types. This is particularly valuable in regions with sparse pre-existing biological data or where monitoring and research resources are limited.

*Hydrologic classification.* In the ELOHA framework, river classification focuses primarily on the hydrologic regime as the main ecological driver. Examples of river types in the United States include stable groundwater-fed rivers; seasonally predictable snowmelt rivers; intermittent, rain-fed prairie and desert rivers and highly dynamic, unpredictable rain-fed perennial rivers (e.g. see Poff, 1996). We recommend classifying rivers according to similarity in hydrologic regime, using flow statistics computed from the baseline hydrographs developed in building a hydrologic foundation. A large suite of flow statistics can be calculated using software packages such as the Indicators of Hydrologic Alteration (Richter *et al.*, 1996), the Hydrologic Assessment Tool (HAT) within the Hydroecological Integrity Process (Henriksen *et al.*, 2006), the River Analysis Package (<http://www.toolkit.net.au/rap>) or GeoTools (<http://www.engr.colostate.edu/~bbledsoe/GeoTool/>). The number of river types in a region should generally reflect the region's heterogeneity in climate and surficial geology, with diverse regions having more river types. Deciding how many river types are appropriate requires a tradeoff between detail (i.e. small within-type variability) and interpretability (i.e. differences among types). In order to be practical to management, a relatively small number of river types should be defined that capture the major dimensions of stream-flow variability. Most previous regional to continental hydrologic classifications have used four to 12 classes, depending on geographic extent, climatic and geologic variation or inclusion of other environmental factors (e.g. Poff & Ward, 1989; Poff, 1996; Snelder & Biggs, 2002; Kennen *et al.*, 2007, 2009; Acreman *et al.*, 2008; Kennard *et al.*, 2009).

Three primary criteria should be considered in selecting a suite of flow statistics for building a river

classification. First, if possible, flow metrics should collectively describe the full range of natural hydrologic variability, including the magnitude, frequency, duration, timing and rate of change of flow events (Richter *et al.*, 1996; Poff *et al.*, 1997; Olden & Poff, 2003; Kennen *et al.*, 2007; Mathews & Richter, 2007). Second, metrics must be 'ecologically relevant', i.e. they are known to have, or can reliably be extrapolated from ecological principles to have, some demonstrated or measurable ecological influence (Arthington *et al.*, 2006; Monk *et al.*, 2007) and hence will be important in assessing ecological responses to hydrologic alteration. Third, the metrics should be amenable to management, so that water managers can develop environmental flow standards using these same hydrologic metrics and evaluate the effect of other water uses in the catchment on these metrics. Hundreds of flow metrics have been published (Richter *et al.*, 1996; Olden & Poff, 2003; Mathews & Richter, 2007) and are potential candidates for inclusion in a regional river classification. In selecting the appropriate variables, we recommend using the method developed by Olden & Poff (2003) contained in the HAT software of the Hydroecological Integrity Assessment process (Henriksen *et al.*, 2006; Kennen *et al.*, 2007). The software performs a redundancy analysis to determine which variables are the most informative components of the flow regime. Users have flexibility in selecting metrics from suites of inter-correlated variables to choose those that best satisfy the three primary criteria above. In addition, the 'environmental flow components' recently added to the Indicators of Hydrologic Alteration software (Mathews & Richter, 2007) are well suited for ELOHA applications due to their strong link between environmental flow assessment and implementation, their ecological relevance, and their intuitive appeal; however, their information overlap with other metrics has yet to be assessed.

*Geomorphic sub-classification.* At the broad, regional scale of ELOHA, it will be useful to account for some of the dominant environmental factors that can provide a context for interpreting ecological responses to flow alteration and thus for guiding development of flow management rules. Geomorphology is of prime interest in this regard, although other factors might be as well (see discussion in next section).



Geomorphic sub-classification of stream or river segments can provide a useful integration of catchment and local geomorphic characteristics such as geology, channel confinement and channel slope (Seelbach *et al.*, 1997; Higgins *et al.*, 2005). The physical setting of a river segment will strongly influence how the flow regime gets translated into the hydraulic habitats experienced by, and available to, the riverine biota. For example, whether a given level of flow will create a bed-moving disturbance or an overbank flow is determined by local characteristics such as channel geometry, floodplain height and streambed composition. In other words, the same level of flow in one geomorphic setting may not translate into an important ecological event, whereas in a second setting it may (Poff *et al.*, 2006a). Therefore, differentiating rivers on the basis of physical characteristics, such as constrained versus alluvial channels or sand-bedded versus cobble-bedded reaches) will contribute to development of flow alteration–ecological response relationships that reflect the direct and indirect influences of hydrologic alteration on both ecological processes and ecosystem structure and function (Snelder & Biggs, 2002; Jacobson & Galat, 2006; Vaughan *et al.*, 2009).

#### *Computing flow alteration*

ELOHA is grounded in the premise that increasing degrees of flow alteration from baseline condition are associated with increasing ecological change. The degree by which each hydrologic variable differs between the baseline and developed condition is calculated for each analysis node using available software (e.g. Henriksen *et al.*, 2006; Mathews & Richter, 2007). This analysis produces a set of hydrologic alteration values expressed as percent deviation from baseline condition for each analysis node, for each of the hydrologic metrics used to define that river type. These values are then used, along with any additional hydrologic variables of management interest, to develop the flow alteration–ecological response relationships that form a basis for developing environmental flow standards.

The ELOHA process calls for modelling hydrographs at ungauged locations, for both baseline and current conditions. Promising approaches (i.e. that are technically feasible and cost-effective) include catchment rainfall–runoff models that use climate and

landscape data and account for human alterations. For example, the water evaluation and planning system (WEAP; <http://weap21.org>) is a GIS-based software platform that uses a rainfall–runoff model to generate unimpaired hydrographs. By incorporating operational rules for water infrastructure, it can also generate current condition hydrographs throughout a stream network, allowing questions of environmental flows to be addressed (Vogel *et al.*, 2007; Yates *et al.*, 2009). Another approach, by Kennen *et al.* (2008), couples runoff modelling for pervious and impervious areas with estimates of annual water extraction, discharges and reservoir storage. This model was used to generate daily hydrographs (current conditions) at ungauged locations throughout New Jersey. It is useful for estimating unimpaired conditions at ungauged locations, degree of hydrologic alteration, and can be adapted to include hydrologic forecasting. Other catchment hydrology models are used to generate and compare unimpaired and human-altered streamflow (e.g. PRMS, HSPF, HEC-HMS, SHE and so on); but many such models are parameter-intensive and can be relatively costly to apply. For a comprehensive description and review of these and other hydrologic models that are applicable to catchment management, refer to Singh & Woolhiser (2002).

#### *Formulating flow alteration–ecological response relationships for environmental flows*

A key element in the ELOHA framework is defining relationships between altered flow and ecological characteristics that can be empirically tested with existing and newly collected field data (see Arthington *et al.*, 2006). These relationships are hypothesised to vary among the major river types, as ecological responses to the same kind of flow alteration are expected to depend on the natural (historic) flow regime in a given geomorphic context.

Ideally, the relationships between ecological variables and degrees of flow alteration would be expressed in a fully quantitative manner (i.e. % ecological change in terms of % flow alteration as measured at multiple sites along a flow alteration gradient – e.g. Arthington *et al.*, 2006). However, ecological changes can also be formalised, and empirically tested, when they are expressed as categorical responses (e.g. low, medium, high) or even trajectory of change (+/–). Such categorical or trajectory



relationships can often be robustly defended and provide valuable information in guiding management decisions in many cases (e.g. Arthington *et al.*, 2003; King *et al.*, 2003; King & Brown, 2006; Shafroth *et al.*, 2009).

*Developing flow alteration–ecological response hypotheses.* In this section, we articulate the principles behind developing testable relationships between ecological variables and flow regime alteration that can serve as a starting point for empirically based flow management at a regional scale. We also point out some key uncertainties in developing such relationships, and we pose these as challenges for near-future environmental flows research.

Riverine scientists possess a very solid, *general* knowledge of how ecological processes and ecosystem structure and function depend on hydrologic variation. The large literature in hydroecology is comprised of both comparative and experimental studies that relate ecological processes or aspects of ecosystem structure and function to one or more hydrologic variables (see examples below). However, very few studies have been published where ecological metrics have been quantified in response to various degrees of flow alteration *per se*, because this requires that hydrologic variables be expressed in terms of deviation from some baseline condition for each sampled location, and this has rarely been done (but see Freeman & Marcinek, 2006; Poff & Zimmerman, 2009). Therefore, empirical models that directly predict ecological responses to various types and degrees of flow alteration (the goal of environmental flows science) are not readily available. The development of such models is an important component of the ELOHA framework, and this can be accomplished by posing testable hypotheses based on the many published studies that document the response of ecological processes and patterns to a range of flow conditions, both natural and altered (e.g. Bunn & Arthington, 2002).

A guiding principle for such model development from the existing hydroecological literature is that ecological responses to particular components of the flow regime can be interpreted most robustly when there is some *mechanistic* or *process-based* relationship between the ecological response and the particular flow regime component. Numerous examples exist for many combinations of ecological responses and flow

components (see Poff *et al.*, 1997; Bunn & Arthington, 2002; Nilsson & Svedmark, 2002; Poff & Zimmerman, 2009). For instance, with increasing frequency of high flow disturbances, macroinvertebrate communities shift toward species adapted to high mortality rates, such as those having short life cycles and high mobility (Richards *et al.*, 1997; Townsend, Scarsbrook & Dolédec, 1997). More frequent flow fluctuations or increased stream flashiness (such as induced by operations of hydropower dams or urbanisation) favour fish species with more generalised versus specialised foraging strategies (Poff & Allan, 1995) or that are habitat generalists (Bain, Finn & Booke, 1988; Pusey, Kennard & Arthington, 2000) or that are more tolerant of stressful inter-flood low flow periods (Roy *et al.*, 2005). Prolonged (and unnaturally timed) low flows can dewater floodplain vegetation and cause more drought-tolerant species to replace riparian species (Leenhouts, Stromberg & Scott, 2006) or reduce fast-flow specialist fish species and encourage habitat generalists (Freeman & Marcinek, 2006). Truncation of natural flood peaks can prevent recruitment of indigenous riparian vegetation and allow non-native trees to become established and proliferate (Stromberg *et al.*, 2007) and can facilitate the proliferation of non-native, flood-intolerant fish species (Meffe, 1984). The natural timing of flood peaks can prevent the establishment of non-native fish (Fausch *et al.*, 2001), whereas the loss of such seasonal flooding can promote success of non-native fish species (Marchetti & Moyle, 2001) and even modify river food webs (Wootton, Parker & Power, 1996). The magnitude of flood peaks can determine the degree of scouring mortality of fish eggs in streambed gravel (Montgomery *et al.*, 1999), and altering the duration of flooding can modify geomorphic processes such as lateral channel migration (Richter & Richter, 2000). In terms of ecosystem processes, magnitudes of transport of nutrients and suspended organic matter are dictated by frequency and duration components of the hydrograph (Doyle *et al.*, 2005). In summary, these clear relationships (and many others) reflect strong linkages between flow and ecological processes in both unmodified and regulated rivers of different types. This information provides a scientifically sound and empirically robust foundation for flow-based management of streams and rivers at regional scales.

The exploration of relationships between flow alteration and ecological responses begins by posing

a series of plausible hypotheses that are based on expert knowledge and understanding of the hydro-ecological literature. In our experience scientists can readily formulate hypotheses that express testable relationships between flow alteration and ecological changes once they are asked to focus on a limited set of hydrologic variables. Initial hypotheses describing flow alteration–ecological response relationships can usually be generated fairly readily by scientists working together in a well-facilitated, collaborative setting (see Arthington *et al.*, 2004 and Cottingham, Thoms & Quinn, 2002 for comments on expert panel approaches). Indeed, in a workshop among many of

the authors of this paper, we quickly generated a number of process-based hypotheses describing expected trajectories of ecological change associated with specific types of flow alteration based on our collective understanding of the literature (Table 1). Similar and more specific hypotheses can reasonably be developed for particular regions by scientists familiar with the ecology and hydrology of a particular region. Assembling experts to develop flow alteration–ecological response relationships will also assist scientists in identifying available ecological data sets and in designing monitoring programs or research projects for validating and refining the relationships.

**Table 1** Examples of hypotheses to describe expected ecological responses to flow alteration, which were formulated by the authors of this paper during a 2006 workshop

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*Extreme low flow*

Hyp: Depletion of extreme low flows in perennial streams and subsequent drying will lead to rapid loss of diversity and biomass in invertebrates and fish due to declines in wetted riffle habitat, lowered residual pool area/depth when riffles stop flowing, loss of connectivity between viable habitat patches and poor water quality

Hyp: Increased dry spell duration in dryland or intermittent rivers will lead to reduced diversity and biomass of invertebrates and fish due to reduction in permanent, suitable aquatic habitat

Hyp: Increased duration of extreme low flows will result in riparian canopy die back in arid to semi arid landscapes

*Low flow*

Hyp: Depletion of low flows will lead to progressive reduction in total secondary production as habitat area becomes marginal in quality or is lost

Hyp: Augmentation of low flows may lead to an initial increase in total primary and secondary production but this would decline with drowning of productive riffles and/or increased turbidity and decreased light penetration

Hyp: Augmentation of low flows will cause a decline in richness and abundance of species with preferences for slow flowing, shallow water habitats, whereas fluvial specialists or obligate rheophilic species would shift in distribution or decline in richness and abundance if low flows were depleted

Hyp: Augmentation of low flows will result in increased establishment and persistence of aquatic and riparian vegetation with concomitant shifts in species distributions towards increased dominance by fewer species

*Small floods/high flow pulses*

Hyp: Lessened frequency of substrate disturbing flow events leads to shift to long lived, large bodied invertebrate species in non flashy streams

Hyp: Lessened frequency of substrate disturbing flow events leads to reduced benthic invertebrate species richness as fine sediments accumulate, blocking substratum interstitial spaces

Hyp: Increased frequency of substrate disturbing events leads to a shift toward 'weedy' invertebrate species and loss of species with poor re colonisation ability

Hyp: Increased flood frequency (in channels) will reduce abundance of young of the year fish, but decline in flood frequency would favour flood intolerant species

Hyp: A decrease in inter annual variation in flood frequency (i.e. stabilised flows) will lead to a decline in overall fish species richness and riparian vegetation species richness, as habitat diversity is reduced

Hyp: Changes in small flood frequency will lead to changes in channel geometry (dependent upon stream channel materials)

*Large floods*

Hyp: Lessened frequency or extent of floodplain inundation will lead to reduced invertebrate and fish production or biomass due to loss of flooded habitat and food resources supporting growth and recruitment

Hyp: Increases in floodplain inundation frequency will enhance productivity in riparian vegetation species through increased microbial activity and nutrient availability, up to a point of water logging, after which productivity would decline due to anaerobic soil conditions

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Scientists applying ELOHA should formulate similar hypotheses for their region of interest as a first step in developing flow alteration ecological response relationships. Flow categories based on 'environmental flow components' from Mathews & Richter (2007).

*Compiling ecological data to test flow–ecology hypotheses.* A great diversity of approaches exists for describing and measuring ecological responses to flow alteration. Ecological indicators (Table 2) may be categorised in a variety of ways: taxonomic identity, level of biological organisation (e.g. population or community), structural contribution (e.g. abundance of individuals or number of species), functional contribution in the system (e.g. trophic level) or traits that reflect adaptation to a dynamic environment (e.g. life-history characteristics or morphological features) and rate of response to temporal change (e.g. how quickly species and communities

respond to environmental change or whether they reflect transient or ‘equilibrium’ conditions). Additionally, ecological processes and biota may respond to flow alteration either directly (e.g. as a reproductive cue) or indirectly through a water quality or habitat-mediated response (see Bunn & Arthington, 2002 for guiding principles). Indicators of social value may also be used to assess flow alteration. The response times of these multiple possible response variables to flow alteration can vary significantly. For example, mature riparian forests may require decades to respond to a flow alteration (Nilsson & Svedmark, 2002), whereas riparian seedlings and macroinvertebrate

**Table 2** Considerations in selecting ecological indicators useful in developing flow alteration ecological response relationships

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*Mode of response*

Direct response to flow, e.g. spawning or migration

Indirect response to flow, e.g. habitat mediated

*Habitat responses linked to biological changes*

Changes in physical (hydraulic) habitat (width depth ratio, wetted perimeter, pool volume, bed substrate)

Changes in flow mediated water quality (sediment transport, dissolved oxygen, temperature)

Changes in in stream cover (e.g. bank undercuts, root masses, woody debris, fallen timber, overhanging vegetation)

*Rate of response*

Fast versus slow

Fast: appropriate for small, rapidly reproducing, or highly mobile organisms

Slow: long life span

Transient versus equilibrium

Transient: establishment of tree seedlings, return of long lived adult fish to potential spawning habitat

Equilibrium: reflect and end point of ‘recovery’ to some ‘equilibrium’ state

*Taxonomic groupings*

Aquatic vegetation

Riparian vegetation

Macroinvertebrates

Amphibians

Fishes

Terrestrial species (arthropods, birds, water dependent mammals, etc.)

Composite measures, such as species diversity, Index of Biotic Integrity

*Functional attributes*

Production

Trophic guilds

Morphological, behavioural, life history adaptations (e.g. short lived versus long lived, reproductive guilds)

Habitat requirements and guilds

Functional diversity and complementarity

*Biological level of response (process)*

Genetic

Individual (energy budget, growth rates, behaviour, traits)

Population (biomass, recruitment success, mortality rate, abundance, age class distribution)

Community (composition; dominance; indicator species; species richness, assemblage structure)

Ecosystem function (production, respiration, trophic complexity)

*Social value*

Fisheries production, clean water and other ecosystem services or economic values

Endangered species

Availability of culturally valued plants and animals or habitats

Recreational opportunities (e.g. rafting, swimming, scenic amenity)

Indigenous cultural values

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communities may do so on an annual cycle. Thus, selecting an appropriate suite of ecological indicators should be guided by consideration of the different timeframes within which specific ecological responses occur relative to particular kinds of flow alteration, as well as by the ability to monitor these various responses over time.

Ideal ecological (including habitat) response variables are (i) sensitive to existing or proposed flow alterations; (ii) amenable to validation with monitoring data and (iii) valued by society (e.g. a decrease in fish abundance could substantially affect important protein sources for local communities). While we advocate the use of process-based ecological response variables, some composite ecological indices may be useful as well, since they correlate with human-induced changes in streamflow. Examples include the indices of biotic integrity for fish (e.g. Fausch, Karr & Yant, 1984; Kennard *et al.*, 2006a,b) or benthic invertebrates (e.g. DeGasperi *et al.*, 2009), and the lotic-invertebrate index for flow evaluation scores (e.g. Monk *et al.*, 2007). However, it may be more useful to disaggregate these indices into their component metrics, some of which may represent a mechanistic relationship to flow or habitat. As indicated above, many studies have demonstrated that ecological responses to flow variation and alteration can be inferred when viewed through the prism of the biological attributes of species (e.g. resource and habitat utilisation traits or life-history traits), and species trait databases are now being compiled regionally to globally for macroinvertebrates (e.g. Usseglio-Polatera *et al.*, 2000; Poff *et al.*, 2006b) and fish (Winemiller & Rose, 1992; Welcomme, Winemiller & Cowx, 2006).

In many cases, developing relationships that link flow alteration to habitat response can provide valuable information in developing regional environmental flow criteria. In particular, where biological data and scientific resources are scarce (e.g. in many developing countries), habitat assessments may provide a critical scientific basis for environmental flows. Approaches to linking flow regime alteration to habitat change are relatively well developed (Bovee *et al.*, 1998; Bowen, Bovee & Waddle, 2003; Pasternack, Wang & Merz, 2004; Crowder & Diplas, 2006; Jacobson & Galat, 2006), and they allow some inference about many ecological responses, albeit with some uncertainty (Tharme, 2003; Gippel, 2005). Flow-habitat linkages and their ecological consequences

provide a core component of several existing environmental flow method (e.g. downstream response to imposed flow transformation: Arthington *et al.*, 2003; King *et al.*, 2003).

In general, developing characterisations of hydraulic habitat conditions that can be applied at the regional scale depends substantially on a segment-scale geomorphic sub-classification that resolves river reaches with similar channel morphology. Such geomorphic subtypes would be expected to have similar hydraulic responses to altered flow regimes. Low-intensity hydraulic habitat assessment methods may be applicable to generalise hydraulic habitat relations for specific geomorphic subclasses. For example, Lamouroux (1998), Lamouroux, Souchon & Herouin (1995) and Booker & Acreman (2007) have developed generalised models for depth and velocity at the stream reach scale, and Saraevan & Hardy (2009) present a method for extrapolating reach-specific habitat data to unmeasured reaches throughout a catchment using a process based on hydrologic and geomorphic stratification. Additionally, applications of habitat-based methods like the wetted perimeter approach (Gippel & Stewardson, 1998), PHABSIM (Bovee *et al.*, 1998) or MesoHABSIM (Parasiewicz, 2007) could provide habitat information useful in the ELOHA framework.

*Flow alteration–ecological response relationships.* The functional relationship between an ecological response and a particular flow alteration can take many forms, as noted by Arthington *et al.* (2006). Based on current hydroecological understanding, we expect the form of the relationship to vary depending on the selected ecological response variable(s), the specific flow metric(s) and the degree of alteration for a given river type. These relationships could follow a number of functional forms, from monotonic to unimodal to polynomial. Different ecological response variables may increase or decrease with flow alteration, and the functional form of the response may depend on whether flow alteration of a particular flow variable increases or decreases. We illustrate how various ecological responses may vary with specific components of flow alteration in Fig. 3, which presents plausible relationships for three river types (Fig. 4). For each river type the reference condition is represented by the range of natural variation for both the flow variable and the ecological variable of



interest, and the ecological response is depicted in terms of deviation from the reference flow condition.

For snowmelt river types (Fig. 3a), the successful recruitment of native riparian trees often depends on seed release being coincident with the timing of flows of sufficient magnitude to raft seeds onto suitable riverbank habitat (e.g. cottonwood in the western North America; Mahoney & Rood, 1998). Some alteration of high flow timing can occur and still coincide with seed release; however, if high flows come earlier than seed release (negative change) or if they are delayed until after seed release (positive change) then recruitment is expected to drop off precipitously in a threshold-type response (Fig. 3a).

In stable groundwater-fed streams, low flows generally have relatively short duration (Poff, 1996). Reducing the duration of low flows in these systems would not be expected to have a large effect on native fish (solid line with no slope in Fig. 3b) because low flow stress is generally transient under natural conditions. By contrast, increasing the duration of low flows could dewater habitat and damage native species (see Moyle *et al.*, 2003), perhaps via a threshold-type reduction (solid step-function line in Fig. 3a). However, the effect could depend on geomorphic context. For example, a river with deep pools would offer refuges for fish during extended low flow periods and thus a more gradual and continuous (linear) ecological response would be expected (dashed line in Fig. 3a).

Third, naturally flashy streams and rivers are typified by high frequency or rapid onset of high flows. Non-native species of fish may fail to establish in such streams if they lack behavioural adaptations to rapid onset of erosive flows (Meffe, 1984) or if the vulnerable juvenile life stage is present during periods of peak flows (Fausch *et al.*, 2001). Figure 3c shows how a reduction in high flow frequency could benefit non-native fish species, possibly as a threshold response by allowing a sufficient number of juveniles to escape mortality and establish large populations. By contrast, increasing high flow frequency would be expected to depress the success of poorly adapted fishes (solid line with negative slope); however, high structural habitat heterogeneity or the presence of within-channel refuges (pools, backwaters) could provide hydraulic refuges and ameliorate this response (dashed line).

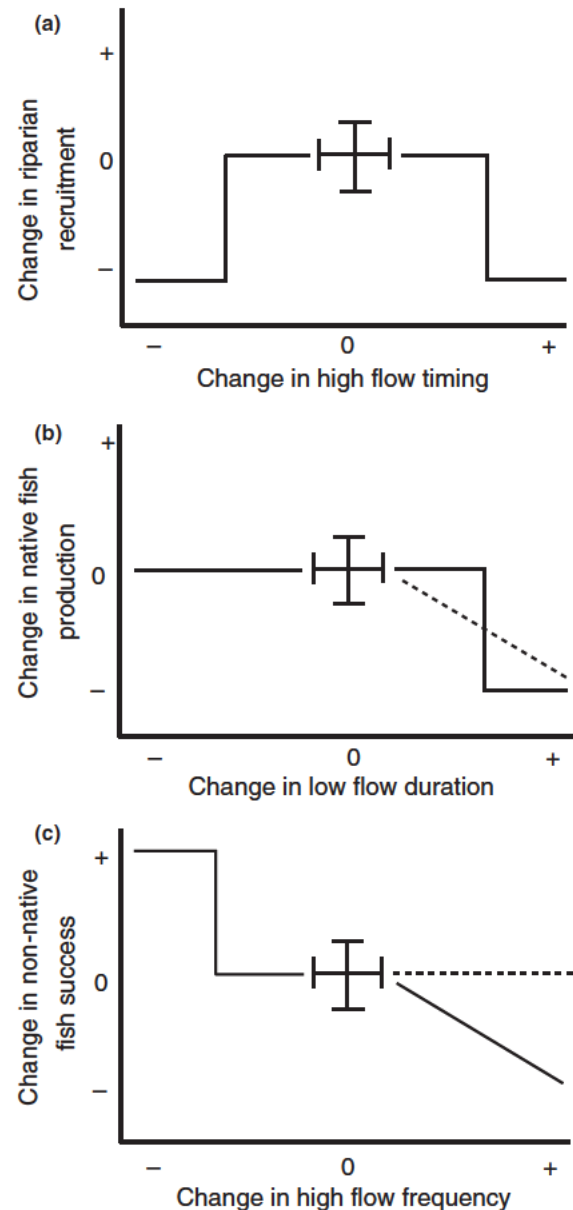


Fig. 3 Illustrative flow alteration ecological response relationships for each of three river types: (a) snowmelt, (b) groundwater fed and (c) flashy. For each relationship the change in the flow metric (X axis) ranges from negative to positive with no change representing the reference condition. The response of the ecological variable (Y axis) to the flow alteration across a number of altered sites ranges from low to high. The bracketed space in the centre of the graph represents the natural range of variation in the flow variable and ecological variable in the reference sites. Ecological responses depicted can range in functional form from no change to linear to threshold, depending on the underlying hydroecological mechanisms and, in some cases, on the specific geomorphic context (indicated by dashed line). See text for further explanation and discussion.

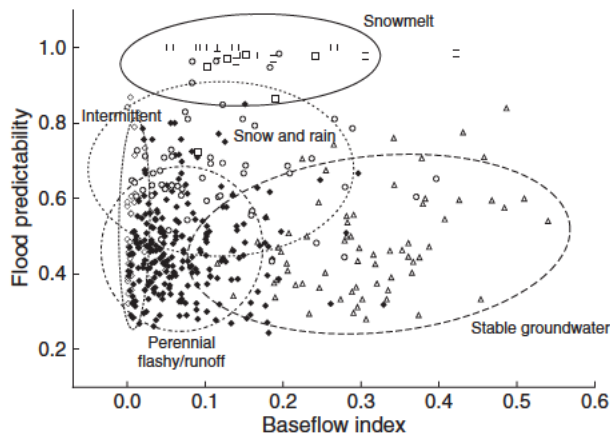


Fig. 4 Plot of five river types in U.S. (modified Olden & Poff, 2003). River types (based on 420 stream gauges) are defined in terms of 11 flow metrics but plotted here in two dimensional space defined by two of the classification flow metrics (flood predictability and baseflow index). Ellipses reflect 90% confidence intervals and show natural range of variability for the two flow metrics for each of five river types: snowmelt (open squares), snow and rain (open circles), stable groundwater (open triangles), perennial flashy/runoff (closed diamonds) and intermittent (open diamonds – combined harsh intermittent, intermittent flashy and intermittent runoff classes from Poff 1996).

These examples illustrate the process of linking particular ecological responses to specific types of flow alterations in the context of natural flow variability for different river types. The illustrative responses shown in Fig. 3 are expressed as continuous functions; however, they could also be more generally represented as categorical or trajectory responses, which would also represent testable hypotheses of response to hydrologic alteration. Certainly a large number of possible flow alteration–ecological response relationships can be postulated and supported from the scientific literature. For any particular application of ELOHA these will reflect the diversity of river types and ecological response variables of interest in a given region.

One important reason for developing a flow regime classification is that the form and direction of an ecological response to flow alteration is hypothesised to be similar within river types and vary among river types. For example, Fig. 4 shows five river types developed for 420 streams with unmodified flow regimes in the United States (Poff, 1996). The ellipses represent the 90% confidence limits for each river type expressed in terms of two of the flow classification variables (baseflow stability and flood predictability) that are ecologically relevant and amenable to

management action. The size of each ellipse represents the natural range of variation for the river type in this two-dimensional space, and based on these natural differences, we would predict different ecological responses to similar types of flow alteration. For example, the stable groundwater type has a higher degree of baseflow constancy ( $x$ -axis) than the perennial flashy/runoff type or the intermittent type. Ecological differences exist between these types of streams (see Poff & Allan, 1995). A flow alteration that introduced fluctuations in baseflow (e.g. below a hydro-power dam) would be expected to have a much greater ecological effect in the stable groundwater type than in either of the other two types, because they are already highly variable. Conversely, a stabilisation of baseflow conditions would likely induce a large ecological response in the intermittent and perennial types, but not in the stable groundwater type where baseflows are already relatively constant. On the  $y$ -axis of Fig. 4, the snowmelt type is distinguished by having a very predictable timing of peak flow. A loss of this seasonality would be ecologically important for the snowmelt type, and possibly for the snow/rain type, but less so for the perennial or stable groundwater systems where high pulse predictability is naturally low.

Compiling existing data will enable, in many cases, a statistical analysis of the form of the functional responses illustrated in Fig. 3 and a test of the degree to which such responses differ between river types. Exploring these statistical associations will allow identification of critical information gaps and research needs. For example, the ability to detect a threshold versus linear response for some ecological response variable along a flow alteration gradient may be difficult because ecological data are missing within some critical range of flow alteration or because a small sample size has insufficient statistical power to detect a threshold response (see Poff & Zimmerman, 2009). Such initial outcomes can guide strategies for targeting future field data collection at specific points along the flow alteration gradient to resolve key uncertainties (Arthington *et al.*, 2006).

### Toward setting environmental flow standards

Functional relationships between flow alteration and ecological responses provide critical input for the broader societally driven process of developing river type specific, regional flow standards (see Fig. 1). We

expect that establishing standards for limiting the degree of each type of flow alteration for different river types will ultimately depend on the ecological goals set for a region's river types, as well as on the 'risk' stakeholders and decision-makers are willing to accept to attain those goals. The degree of acceptable risk is likely to reflect the balance between the perceived value of the ecological goals (e.g. maintenance of fisheries may be of particular interest) and the scientific uncertainties in functional relationships between ecological responses and flow alteration. The benchmarking approach of Arthington *et al.* (2006) can be adopted to help establish an ecologically and societally acceptable level of risk. For example, where there are clear threshold responses (e.g. overbank flows needed to support riparian vegetation or provide fish access to backwater and floodplain habitat), a benchmark of low ecological risk might allow for hydrologic alteration that does not cross the threshold. For a linear response where there is no clear threshold for demarcating low from high risk, a consensus stakeholder process may be needed to determine acceptable risk. One possible process for setting such risk levels is to use expert panels to identify 'thresholds of potential concern' (Biggs & Rogers, 2003; Acreman *et al.*, 2008), which establish where along the flow alteration gradient there is agreement among stakeholders (including scientists and managers) that further hydrologic change carries with it unacceptably high ecological risk. This approach incorporates scientifically credible professional judgement and includes multiple ecological indicators, as is commonly employed in performing river-specific environmental flow assessments based on expert judgement in South Africa (Brown & Joubert, 2003; Tharme, 2003), Australia (Cottingham *et al.*, 2002; Arthington *et al.*, 2004) and in the Americas (Richter *et al.*, 2006).

We note here that the flow alteration–ecological response relationships developed for various river types can be used by water managers to guide development of flow standards for individual rivers or river segments, or for sub-catchments of individual rivers, not just for entire classes of rivers. Indeed, society may have different ecological goals for different sub-catchments or rivers within a class, and the flow–ecology relationships can support river-specific standard setting by associating different flow targets with different ecological targets.

### *Challenges of interpreting flow–ecology relationships for water management purposes*

In interpreting flow alteration–ecological response relationships, there are some challenges that must be addressed. First, because ecological responses may be expressed in relation to multiple hydrologic drivers, decisions will have to be made about which relationships are the most important or achievable in a particular management context. One possible way to overcome this challenge would be to consider ecological response(s) in terms of some multivariate hydrologic metric(s) that describes overall flow alteration (e.g. using principal components analysis as in Black *et al.*, 2005). Often, however, it will be most desirable to consider ecological responses in terms of independent flow variables that can be directly manipulated in a management context.

Where multiple ecological response–flow alteration relationships are generated, some process will be required to prioritise for management. In the face of multiple possible management targets, 'paralysis' can be avoided by keeping in mind the motivating objectives of the selection process for hydrologic variables. Flow metrics ideally have been selected to capture a range of natural hydrologic variability, to be ecologically relevant and to be amenable to management manipulation. Depending on what the societally acceptable ecological goals are (Fig. 1), we would imagine selecting those relationships that can be mechanistically interpreted, that are known with reasonable confidence, that best define the hydrologic and ecological character of the river type and that are especially sensitive to human alteration. For example, stable groundwater streams (Fig. 4) are likely to be sensitive to increases in baseflow fluctuations and seasonally pulsed systems (e.g. snowmelt) are likely to be very sensitive to altered timing of pulses. Such class-specific metrics could represent priority management targets, all else being equal. However, we also stress that many metrics would ideally be considered if the management goal is to promote broad ecosystem function. Ideally, a parsimonious suite of flow metrics will emerge that collectively depicts the major facets of the flow regime and explains much of the observed variation in ecological response to particular kinds of flow alteration in each river flow type.



Second, development of robust flow alteration–ecological response relationships will need to take into account the role that other environmental factors play in shaping ecological patterns in streams and rivers. The ecological integrity of rivers is certainly known to reflect factors other than flow regime, such as water quality and habitat structure (Poff *et al.*, 1997; Baron *et al.*, 2002; Kennen *et al.*, 2008; Konrad, Brasher & May, 2008); however, a quantitative understanding of how flow interacts with these other factors is not yet well developed (e.g. Kennard *et al.*, 2007; Stewart-Koster *et al.*, 2007). We view this as an important research frontier in environmental flows. We have attempted to minimise this consideration by calling for a geomorphic sub-stratification within hydrologic classes to assist the translation of streamflows into appropriate hydraulic habitat contexts. However, some accounting of other environmental factors will be necessary in many cases. This could be done either by further stratification (e.g. based on water temperature or water quality; see Olden & Naiman, 2009) or by including additional environmental variables in the flow–ecology models as statistical covariates, which would allow some determination of the independent and interactive effects of flow alteration on ecological processes and metrics.

### Learning by doing: the scientist's long-term involvement

An environmental flow 'standard' is a statement of flow regime characteristics needed to achieve a certain desired ecological outcome. In the ELOHA framework, environmental flow standards are determined by combining the scientific understanding of flow–ecology relationships with a societally defined goal of environmental health and a particular level of risk of ecosystem degradation. Flow standards may take the form of restrictive management thresholds, such as maximum limits of abstraction, or active management thresholds, such as specific flow releases from reservoirs (Acreman & Dunbar, 2004). Attempts to establish such regional standards are evolving in several political jurisdictions in the United States. For example, the State of Michigan has proposed a standard on groundwater pumping that protects fisheries resources for each of 11 classes of streams in the state (MGCAC, 2007). In developing the flow–response lines in Fig. 5, fisheries ecologists examined

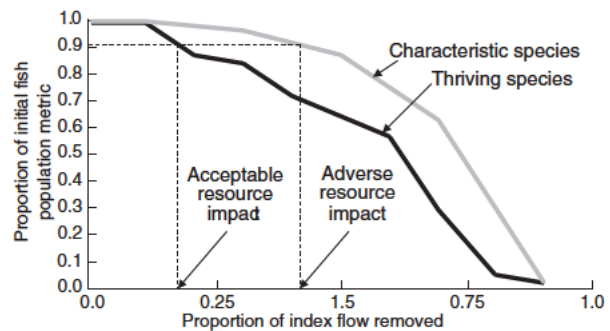


Fig. 5 Progression from flow alteration ecological response relationships to environmental flow standards (modified from MGCAC, 2007). Using existing fish population data across a gradient of hydrologic alteration, scientists developed two flow ecology relationships between populations of 'thriving' and 'characteristic' fish species versus proportion of 'index' flow (median August discharge divided by mean annual discharge) flow reduction in 11 stream types in Michigan, U.S.A. A diverse stakeholder committee then proposed a 10% decline in the thriving fish population index as an acceptable resource impact, and a 10% decline in the characteristic fish population index as an adverse impact. The corresponding flow alteration (X axis) would trigger environmental flow management actions associated with each of these ecological conditions. The 'ten percent rule' applies to all of the 11 stream types, but the shapes of the curves and therefore the allowable degree of hydrologic alteration vary with stream type.

the range of variation in the biological response across the flow alteration (depletion) gradient and effectively smoothed the statistical scatter to create a trend line with cut-points reached by consensus through a stakeholder process (MGCAC, 2007) comparable to benchmarking (see Arthington *et al.*, 2006).

We recognise that assessing the ecological effects of modified flows is only one part of a complex socio-economic–environmental process to decide on the use and protection of a region's water resources. The decision to exploit those resources to any particular level is one that will be taken by governments and stakeholders in the context of their perceived priorities for development and sustainability. In essence, a partnership of managers, scientists and those parts of society that will experience the effects of management actions decides on a redistribution of the costs and benefits of water use within the management area (e.g. Naiman, 1992; Poff *et al.*, 2003; King & Brown, 2006; Rogers, 2006). The scientist's role is to support that decision-making process by accurately and usefully communicating the importance of ecosystem



goods and services provided by streams, rivers and wetlands and the ecological and societal consequences that will result from different levels of flow modification represented in the flow–ecology relationships.

Scientists can also assist in implementing flow standards once they have been established. Specifically, the regional approach of ELOHA affords the opportunity to quantitatively incorporate environmental flow standards within integrated water resources and river basin management. ELOHA's hydrologic foundation synthesises all of the controls – both natural and engineered – on streamflow patterns into one usable database. Thus, it can be useful not only for establishing flow–ecology relationships, but also for integrating them into the social decision-making process. In principle, scientists and managers could use the hydrologic model to test various stakeholder-developed scenarios for coordinating and optimising all geographically referenced water uses in a basin, while maintaining environmental flows. The model should also be able to incorporate predicted hydrologic impacts of climate change. By accounting for the cumulative effects of all water uses, the model could be used to assess the practical limitations to, and opportunities for, implementing environmental flow targets at multiple nodes simultaneously. This would support efforts to prioritise development of restoration projects, optimise water supply or hydropower generation efficiency, or account for cumulative upstream and downstream impacts in permitting decisions. For basins in which water is already over-allocated, such a model could help target flow restoration options such as dam re-operation, conjunctive management of ground water and surface water, drought management planning, demand management (conservation) and water transactions (e.g. leasing, trading, purchasing, banking).

Finally, scientists must maintain an active role in adaptively managing environmental flows. New information may be required to refine flow alteration–ecological response relationships where few data presently exist, and to extend the relationships in places where climate change and other stressors expand the types and gradients of flow alteration and ecological response. Effective adaptive management means designing, implementing and interpreting research programs to refine flow alteration–ecological response relationships, and ensuring that this new

knowledge translates into updated, implemented flow standards (Poff *et al.*, 2003).

## Conclusion

The scientific process and recommendations presented in this paper represent our consensus view for greatly enhancing sustainable management of the world's rivers for ecological and societal benefits in a timely manner and over greater spatial scales than are typically attempted. We recognise that the strength of relationships between flow alteration and ecological response is likely to be subject to various interpretations in many instances. Many relationships are likely to be supported in a trajectory or categorical mode, whereas strong statistical support for incremental or continuous relationships is more difficult to establish. We also recognise that the strength of the relationships necessary to support management or policy action may be a key issue in developing and implementing regional flow guidelines in certain social-political settings.

Despite these acknowledged constraints, the consensus of this group of authors is that the body of scientific knowledge and judgement is strong enough to provide a firm foundation for moving forward. Much remains to be learned, but we know enough to start. One of the key goals of restoration ecology is to 'do no harm' and to attempt to achieve ecosystem self-sustainability through management action (Palmer *et al.*, 2005). The ecological health of the world's riverine ecosystems is presently so threatened that we posit it is in society's best interest to promote regional environmental flow management for freshwater sustainability. Further, through future adaptive learning and research the ELOHA framework can provide a foundation for refining efforts to optimise the tradeoffs inherent between resource exploitation and resource conservation (Dudgeon *et al.*, 2006).

We have emphasised in this paper that scientific knowledge and theory pertaining to flow alteration–ecological response principles has advanced markedly in recent decades, and the calibre of data and 'professional judgement' available to inform relationships between flow alteration and ecological response has vastly improved. Ideally, the ELOHA framework should be used to set initial flow standards that can be updated as more information is collected in an adaptive cycle that continuously engages water

managers, scientists and stakeholders to 'fine tune' regional environmental flow standards (Fig. 1). The process of setting standards during this first iteration should include recognition of knowledge gaps and the need to quantify ecological responses in key areas and in relation to known risk factors. Subsequent iterations will then be informed by more quantified information as needed to satisfy managers and stakeholders. Importantly, we expect that initial applications of the ELOHA framework will greatly help to inform decision-makers and stakeholders about the ecological consequences of flow alteration, and will generate support for the additional data collection needed to further refine the hydrologic foundation, the flow alteration–ecological response relationships and regional environmental flow standards.

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**From:** Jason Peltier

**Sent:** Monday, August 13, 2012 9:46 PM

**To:** Craig Manson (cmanson@westlandswater.org); Jon Rubin; Daniel O'Hanlon; David Bernhardt

**Subject:** Fwd: RSE Process Update

**Attachments:** Final Agenda DWR-PWA-Enviro 8-16-12 Mtg.docx; Untitled attachment 34444.htm; RSEP Paper\_8-13-12 draft.docx; Untitled attachment 34447.htm; Agenda\_Sept Kickoff Mtg\_8-13-12 draft.docx; Untitled attachment 34450.htm; Untitled attachment 34453.dat; Untitled attachment 34456.htm

Begin forwarded message:

**From:** "Fry, Susan M" <[SFry@usbr.gov](mailto:SFry@usbr.gov)>

**Date:** August 13, 2012 6:59:27 PM PDT

**To:** 'Ara Azhderian' <[ara.azhderian@sldmwa.org](mailto:ara.azhderian@sldmwa.org)>, 'Brent Walthall' <[bwalthall@kcwa.com](mailto:bwalthall@kcwa.com)>, 'Cathy Crothers' <[crothers@water.ca.gov](mailto:crothers@water.ca.gov)> <[crothers@water.ca.gov](mailto:crothers@water.ca.gov)>, 'Chris Daley' <[cdaley@westlandswater.org](mailto:cdaley@westlandswater.org)>, 'Curtis Creel' <[ccreel@kcwa.com](mailto:ccreel@kcwa.com)>, 'Dale Hoffman-Floerke' <[dalehf@water.ca.gov](mailto:dalehf@water.ca.gov)>, 'Dan Nelson' <[dan.nelson@sldmwa.org](mailto:dan.nelson@sldmwa.org)>, 'Jason Peltier' <[jpeltier@westlandswater.org](mailto:jpeltier@westlandswater.org)> <[jpeltier@westlandswater.org](mailto:jpeltier@westlandswater.org)>, 'Jim Beck' <[jbeck@kcwa.com](mailto:jbeck@kcwa.com)>, 'Joan Maher' <[JMaher@valleywater.org](mailto:JMaher@valleywater.org)> <[JMaher@valleywater.org](mailto:JMaher@valleywater.org)>, 'Jon Rubin' <[jon.rubin@sldmwa.org](mailto:jon.rubin@sldmwa.org)>, 'Kathy Kelly' <[kkelly@water.ca.gov](mailto:kkelly@water.ca.gov)>, 'Mark Cowin' <[mcowin@water.ca.gov](mailto:mcowin@water.ca.gov)>, 'Rebecca Sheehan' <[rsheehan@mwdh2o.com](mailto:rsheehan@mwdh2o.com)>, 'Roger K Patterson' <[rpatterson@mwdh2o.com](mailto:rpatterson@mwdh2o.com)>, 'Sheila Greene' <[sgreene@westlandswater.org](mailto:sgreene@westlandswater.org)>, 'Terry Erlewine' <[terlewine@swc.org](mailto:terlewine@swc.org)>, 'Tom Birmingham' <[tbirmingham@westlandswater.org](mailto:tbirmingham@westlandswater.org)> <[tbirmingham@westlandswater.org](mailto:tbirmingham@westlandswater.org)>

**Cc:** 'Idlof, Patricia S (Patti)' <[PIdlof@usbr.gov](mailto:PIdlof@usbr.gov)>, 'Susan Mussett' <[susan.mussett@sldmwa.org](mailto:susan.mussett@sldmwa.org)>, 'Karen Clark' <[kclark@westlandswater.org](mailto:kclark@westlandswater.org)>, 'Bill McDonald' <[bmcDonald@staff-tech.net](mailto:bmcDonald@staff-tech.net)>, 'Allen, Kaylee' <[Kaylee.Allen@sol.doi.gov](mailto:Kaylee.Allen@sol.doi.gov)>

**Subject:** RE: RSE Process Update

Hello everyone. Please find attached the following documents:

1. Agenda for the August 16<sup>th</sup> RSE Process update meeting
2. Revised Draft of the RSE Process document
3. Draft Agenda for the RSE Process Kick-off meeting
4. Current list of Invited Stakeholders

I will send a revised draft of the RSE Process Science Review Component by COB Tuesday, August 14<sup>th</sup>. We will be asking for your input on these documents at the meeting on Thursday and so your review prior to the meeting is appreciated.

Thanks, Sue

*Sue Fry*



Bureau of Reclamation  
Mid-Pacific Region  
Area Manager, Bay-Delta Office  
801 I Street, Ste 140  
Sacramento, CA 95814

Office: 916-414-2401

Cell: 916-■■■■-■■■■

-----Original Appointment-----

**From:** Fry, Susan M

**Sent:** Thursday, August 02, 2012 9:07 AM

**To:** 'Ara Azhderian'; 'Brent Walthall'; Cathy Crothers ([crothers@water.ca.gov](mailto:crothers@water.ca.gov)); 'Chris Daley'; Curtis Creel; 'Dale Hoffman-Floerke'; Dan Nelson; Jason Peltier ([jpeltier@westlandswater.org](mailto:jpeltier@westlandswater.org)); Jim Beck; Joan Maher <[JMaher@valleywater.org](mailto:JMaher@valleywater.org)> ([JMaher@valleywater.org](mailto:JMaher@valleywater.org)); 'Jon Rubin'; 'Kathy Kelly'; Mark Cowin; 'Rebecca Sheehan'; Roger K Patterson; 'Sheila Greene'; Terry Erlewine; Tom Birmingham ([tbirmingham@westlandswater.org](mailto:tbirmingham@westlandswater.org)); Bill McDonald; Allen, Kaylee

**Cc:** Idlof, Patricia S (Patti); 'Susan Mussett'; Karen Clark

**Subject:** RSE Process Update

**When:** Thursday, August 16, 2012 3:00 PM-4:30 PM (UTC-08:00) Pacific Time (US & Canada).

**Where:** BOR MPR Bay Delta Conf. Room

An agenda will be provided prior to the meeting.

Call in number: 866-■■■■-■■■■/passcode: ■■■■

Hello all. The next meeting of the PWAs to discuss the RSE process development to date will be on August 16<sup>th</sup> from 3-430pm at Reclamation???'s Bay-Delta Office located at 801 I Street in downtown Sacramento. At this meeting we will (1) discuss the final RSE process document and (2) update you as to development of the Science Review component of the RSE process. I will send an agenda and read-ahead materials by COB Monday, August 13<sup>th</sup>. I will also send an appointment via the Outlook calendar.

I appreciate your time and attention to this important process. Thanks, Sue

*Sue Fry*

Bureau of Reclamation  
Mid-Pacific Region  
Area Manager, Bay-Delta Office  
801 I Street, Ste 140  
Sacramento, CA 95814

Office: 916-414-2401

Cell: 916-■■■■-■■■■

## **Agenda**

### **Remanded Biological Opinions (BiOps) for the Coordinated Long-term Operation of the Central Valley Project (CVP) and State Water Project (SWP)**

#### **Remand Stakeholder Engagement (RSE) Process**

Meetings will be held at  
801 I Street, Ste. 140  
Sacramento, California

**Call-in:** 866-■■■■-■■■■ **Passcode:** ■■■■

*Please arrive a few minutes early to accommodate security processing*

**Meeting with Environmentalists and Fishing Interests:** 11-12:30 p.m., August 16, 2012

**Meeting with DWR & PWAs:** 3-4:30 p.m., August 16, 2012

1. Introductions
2. Revised draft RSE Process Document
3. Revised draft RSE Process Science Review Component Document
4. Science Experts
5. September 6/7 Draft Kick-Off Meeting Agenda



## **Remand Stakeholder Engagement Process**

### **Section 7 ESA and NEPA Compliance for the Remanded Biological Opinions on the Coordinated, Long-Term Operation of the Central Valley Project and State Water Project**

Bay-Delta Office  
Mid-Pacific Region, Bureau of Reclamation  
August \_\_, 2012

#### **Introduction**

The Bureau of Reclamation (Reclamation) began formal consultation in 2008 with the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) on the coordinated, long-term operation of the Central Valley Project (CVP) and the State Water Project (SWP) pursuant to section 7 of the Endangered Species Act (ESA). The biological opinions (BiOps) issued by the FWS and NMFS (collectively, the Services) were remanded by the U.S. District Court for the Eastern District of California and both agencies were ordered to issue new BiOps. In addition, Reclamation was ordered by the court to comply with the National Environmental Policy Act (NEPA) prior to accepting and implementing the action described in the new BiOps to be issued by the FWS and NMFS (collectively, the Services). Because the BiOps will address the operation of the SWP, it is expected that the remand process will support development of a Consistency Determination under the California ESA for the operation of the SWP in coordination with the CVP.

In the course of the remand and NEPA processes, Reclamation will undertake the “remand stakeholder engagement process” (RSE process) described in this paper. The impetus for the RSE process is the discussions held in the fall of 2011 between certain parties in the *Consolidated Salmonid Cases* and *Consolidated Delta Smelt Cases*. These discussions attempted to reach a stipulated agreement regarding a schedule and process for the participation of non-Federal parties in the remand and NEPA processes. While an agreement was not reached, the commitments made by Reclamation during those discussions which are within its purview will be voluntarily effected through the RSE process.

Reclamation, FWS, and NMFS must meet the deadlines ordered by the court.<sup>1</sup> Accordingly, there will be limits on the time available for the RSE process. Furthermore, final decisions regarding the EIS, the content of information to be submitted by Reclamation to supplement its 2008 biological assessment (BA), the proposed action to be consulted upon, and the acceptance of RPAs, if any, proposed by the Services are legally committed to Reclamation’s discretion and necessarily rest with it.

---

<sup>1</sup> December 2013 for the FWS Final BiOp, Reclamation decision on that BiOp and any RPA, and completed NEPA review. February 2016 for the NMFS Final BiOp, Reclamation decision on that BiOp and any RPA, and EIS, with the ROD due by April 2016.

**General Approach to the Remand and NEPA Processes**

Reclamation anticipates providing supplemental information to the Services which updates its 2008 BA. This information may be presented as a supplemental BA, an entirely new BA, or in some other format. A decision in this regard will be made at a later date.

In order to coordinate the remand of the FWS BiOp with the NEPA process, Reclamation will provide supplemental information to the FWS by March, 2013. NMFS has stated that to meet the court deadline of April 2016 for its new BiOp, Reclamation must provide supplemental information -- with minimal changes to the proposed action -- by August 2013. If more than minimal changes are proposed, then supplemental information may have to be provided sooner.

The action to be addressed in the remand, whether consisting of the RPAs in the remanded BiOps or revisions to them, will have two components: (i) the coordinated, long-term operation of the CVP and SWP; and (ii) structural modifications to project facilities. Collectively, these were referred to as the “project description” in the 2008 BA. For the remand, the action may also include measures to minimize or offset the adverse effects of the coordinated, long term operation of the CVP and SWP on listed species.

The action which is subject to the remand process will be the “preferred alternative” identified in the final EIS. Given that the court has ordered the FWS’s new BiOp to be completed by December 2013, which is more than two years before the deadline for the NMFS’s new BiOp, the EIS will have to proceed concurrently with the remand of the FWS BiOp.

As required by the court’s order, an EIS will be completed by December 2013. If the NMFS’s final BiOp, which is not due for more than another two years, calls for actions which differ significantly from the preferred alternative selected in the 2013 EIS and the accompanying Reclamation Record Of Decision (ROD), then the 2013 EIS and ROD may have to be supplemented or otherwise revised before Reclamation can proceed with the implementation of the action (or RPA) which is the subject of NMFS’s final BiOp.

**Overview of the RSE Process**

Typically, section 7 consultations between an “action agency” such as Reclamation and one or both Services have involved only the Federal agencies, or have provided only limited opportunities for input from non-Federal parties.

However, for the remand, the RSE process will provide non-Federal parties a more formal structure in which to engage with Reclamation and each other for the purpose of understanding key issues and perspectives and providing information which will inform Reclamation’s decision making. Subject to the constraints of the court ordered deadlines and the limitations of any applicable laws, this will be done in three ways.

First, Reclamation has determined that DWR qualifies as an “applicant” within the meaning of section 7 of the ESA. Accordingly, Reclamation will work closely with DWR to successfully

complete the remand process and DWR will participate in the RSE process by virtue of its being the applicant. In addition, DWR will be a cooperating agency for the EIS.

Second, Reclamation recognizes that there are many entities in addition to DWR which have an interest in the remand process even though they do not qualify as applicants under section 7. Accordingly, in addition to DWR as an applicant, Reclamation will invite water agencies which are representative of the range of CVP and SWP contractors and commercial fishing and environmental organizations which represent a range of publics interested in the Bay-Delta (collectively, “invited stakeholders”) to participate in structured, facilitated discussions and exchanges of information regarding certain aspects of the remand and NEPA processes. In light of their interests and responsibilities, Reclamation will also invite the California Department of Fish and Game (DFG), FWS, and NMFS (collectively, the fish resource agencies) to participate in its discussions with DWR and invited stakeholders, particularly regarding core scientific issues.

Third, while the RSE process will focus on receiving information and input from the invited stakeholders, Reclamation may also invite input from other interested parties on matters germane to the coordinated, long term operation of the CVP and SWP. This will be done on an ad hoc basis as time permits.

With regard to invited stakeholders, Reclamation has also designated, or will offer to designate, each invited water agency as a non-Federal representative pursuant to 50 CFR 402.08. This is being done in recognition of their role as governmental entities which have a contractual relationship with Reclamation and/or DWR.

### **Facilitated Engagement with DWR and the Invited Stakeholders**

Reclamation is committed to an RSE process that is balanced, open, understandable, and appropriately transparent, that contributes to the development of required information, and that assists in informing Reclamation’s decision making and, potentially, that of the fish resource agencies. Through structured, professionally facilitated processes, DWR and all invited stakeholders will be afforded the opportunity to provide input to, and to engage with, Reclamation, as will the fish resource agencies if they choose to participate in the RSE process. This will be done through requests for information from DWR and the invited stakeholders and through discussions and exchanges with Reclamation about the information provided to it and about the conduct and status of the remand and NEPA processes.

DWR and the invited stakeholders will not constitute a Federal advisory committee tasked with providing advice to Reclamation. Rather, DWR and the invited stakeholders will each speak for themselves to provide such information and input to Reclamation as it deems appropriate. Reclamation will consider points of agreement as well as disagreement among DWR and invited stakeholders, but will not seek a consensus.

Furthermore, the RSE process is not intended to be a single “negotiating table,” but rather a flexible process that uses a combination of formats. Thus, Reclamation will meet with DWR and invited stakeholders individually, in different combinations, and collectively, and will invite the

fish resource agencies to participate as appropriate. Meetings likely will be a combination of face-to-face gatherings, web-based events, and conference calls. They will be conducted in formats most conducive to the purpose to be served (e.g., general discussion meetings, technical workshops, panel presentations, information only meetings, etc.) and in compliance with all applicable Federal and state laws regarding open meetings. All meetings will be subject to yet to be developed ground rules that will address access by the broader public and media, audio or video recording, live Web streaming, use and distribution of meeting notes, etc. A successful RSE process will depend on acceptance of ground rules by all invited stakeholders.

The RSE process will engage DWR and invited stakeholders at both the management and technical levels. Some interactions will be heavily oriented to information and data exchange and scientific issues and will, therefore, involve an invited stakeholder's technical staff and consultants. Other interactions will be focused on key interests and policy questions and will, therefore, involve management personnel.

Throughout the remand and NEPA processes, Reclamation will hold regularly scheduled meetings with management level representatives of DWR and the invited stakeholders (singly, in various combinations, and collectively) to discuss the conduct and progress of the two processes and to address major issues. Meetings with technical staff and consultants will be scheduled on an ad hoc basis to address scientific and technical tasks and issues. The fish resource agencies will be invited to participate.

Reclamation will keep a running list of meetings which it holds as part of the RSE process with subsets of DWR and the invited stakeholders. Brief summaries of such meetings indicating the participants and their affiliations, the meeting date, and the general topics discussed will be made available to all participants in the RSE process. Written information (either paper or in electronic format) received by Reclamation from DWR, invited stakeholders, and the fish resource agencies in the course of the RSE process will be made available to all participants (probably through posting on a public website).

### **DWR and Invited Stakeholder Participation in the Remand Process**

To the extent permitted by the court ordered schedules, Reclamation will involve DWR and the invited stakeholders in the remand process at the following junctures, with the fish resource agencies also being invited to participate as appropriate:

- A science review process will be organized and supported by Reclamation for the purpose of identifying potentially useful information and gathering input from DWR and the invited stakeholders on a defined set of core scientific issues. The design of this science review process, and the identification of core scientific issues, will be among the first items on which Reclamation will seek input. A separate paper describing this science review process will be developed by Reclamation.
- DWR and the invited stakeholders will be afforded the opportunity to provide new information and analyses to Reclamation, to include new data and scientific studies on the effects of project operations and other factors on the listed species, and on the status of the listed species and of their designated critical habitats.

- Before supplemental information (in whatever format) is formally submitted by Reclamation to FWS and/or NMFS, Reclamation will provide DWR and the invited stakeholders with the opportunity to review and comment on it.
- Reclamation will seek input from DWR and the invited stakeholders regarding the description of the action to be addressed in the remand process.
- Reclamation will regularly update DWR and the invited stakeholders on the discussions and communications it is having with the Services, including questions or requests for information received by Reclamation from the Services.
- When draft BiOps are received from the Services, Reclamation will provide them to DWR and the invited stakeholders for their review and comment, subject to such schedules as those two agencies may require. Reclamation will consider any comments it receives when formulating its responses to the draft BiOps.
- If it appears that the BiOps will be jeopardy opinion(s), DWR and the invited stakeholders will be afforded the opportunity to provide input to Reclamation on the development of a BiOp's RPA and on suggested alternatives to a proposed RPA. Such input will be considered by Reclamation in formulating its responses to the FWS and NMFS.

### **DWR and Invited Stakeholder Participation in the NEPA Process**

In addition to what is required by the NEPA regulations (i.e., public scoping meetings, a scoping report, and public review of a draft EIS), Reclamation will involve DWR and the invited stakeholders in the NEPA process at the following junctures to the extent the court ordered schedules permits, with the fish resource agencies being invited to participate as appropriate:

- Reclamation will invite DWR, DFG, water agencies (invited stakeholders and otherwise), and other governmental entities, as appropriate, to become cooperating agencies for the EIS. The cooperating agencies will be able to provide input during the development of the EIS as provided by the NEPA regulations.
- As provided by the NEPA regulations, the cooperating agencies will be allowed to review and comment on the administrative draft(s) of the EIS. In addition, invited stakeholders who are not cooperating agencies will, as part of the RSE process, be afforded the opportunity to review and comment on the administrative draft.
- Through the RSE process, but consistent with the requirements of the NEPA regulations, Reclamation will meet with the invited stakeholders to receive their input on issues and concerns that will be considered in the development of alternatives.
- In addition to providing the draft EIS for public review and holding public meetings to take comment on it, Reclamation will meet with the invited stakeholders to discuss their comments if requested to do so and if time permits.

### **Reclamation's Management of the Remand, NEPA, and RSE Processes**

The Mid-Pacific Region's Bay-Delta Office has the lead responsibility for the remand and NEPA processes, and for the RSE process. This office will be assisted by other offices in the Mid-Pacific Region. In addition, Reclamation has already procured, and/or will be procuring, the



services of consulting firms to assist in the preparation of the EIS and of the supplemental information for the remands.

As it committed it would do, Reclamation has obtained the services of an individual experienced in managing complex EISs and section 7 ESA consultations. That individual is Bill McDonald (Staff Tech, Inc.), the recently retired Regional Director of Reclamation's Pacific Northwest Region. He will assist Reclamation with the integration of the remand and NEPA processes and with the RSE process, to include interfacing regularly with DWR, the invited stakeholders, and the fish resource agencies.

Reclamation has also obtained an experienced professional facilitator, J. Michael Harty (Kearns & West), to assist with RSE process design and implementation. His team's responsibilities will include developing meeting or discussion formats and ground rules for participation, facilitating meetings and workshops, promoting constructive communication and the sharing of information, and tracking action items that result from meetings, workshops, or discussions.

Messrs. Harty and McDonald will work together closely in effecting the RSE process under the direction of the Bay-Delta Office.



## **AGENDA**

### **Invited Stakeholder Meeting**

**Reclamation Stakeholder Engagement Process for the  
Remand of the FWS and NMFS BiOps on the  
Coordinated, Long Term Operation of the CVP and SWP**

September [6 or 7], 2012  
Room \_\_\_\_, 801 I Street, Sacramento, CA

1. Welcome (*5 minutes*) Sue Fry
2. Introductions (*10 minutes*) All
3. Review meeting objectives (*5 minutes*) Sue Fry  
  
Develop a common understanding of the purposes of and ground rules for the RSE process  
Develop a common understanding of schedule constraints  
Initiate substantive discussions of EIS alternatives and science review  
Outline next steps (Sept. – Dec.) in the RSE process
4. Review the RSE process paper\*\* (*20 minutes*) Sue Fry
5. Discuss proposed RSE process ground rules\*\* (*20 minutes*) Mike Harty
6. Overview of schedule for the remand\*\* (*40 minutes*) Sue Fry  
  
BREAK (*20 minutes*)
7. Presentation on EIS alternatives (*60 minutes*) Sue Fry/Gwen Buchholz  
  
A presentation will be made on the preliminary array of alternatives for the EIS.  
Materials will be provided at the meeting for review and comment. They will be  
discussed at the next meeting at the end of Sept., after which they will be finalized.
8. Discuss the science review component of the RSE process\*\* (*45 minutes*) Sue Fry
9. Discuss next steps and scheduling of future meetings (*15 minutes*) Sue Fry
10. Adjourn

---

Materials will be provided in advance for agenda items marked with double asterisks (\*\*)





**From:** Jason Peltier

**Sent:** Tuesday, August 14, 2012 8:46 AM

**To:** Jerry Meral; Vogel, Nancy; Bill Kahrl; T Birmingham; Karla Nemeth; Marty Grimes; Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLOYD Fryer; Martin McIntyre; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheehan,Rebecca D; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** Delta campaign

I know it is painful to read this garbage [especially for Curtis] but Bacher is one of their loudest megaphones.....

Give Southern California ratepayers and the Delta a chance

by Dan Bacher  
IndyBay Media  
Monday, Aug. 13, 2012

A LA Times editorial, "Give the Bay Delta Conservation Plan a chance," inexplicably accuses "critics of the proposed tunnel" for claiming that "wasteful Southern Californians intend to suck every last drop of the Sacramento River to water their luxuriant lawns." (<http://discussions.latimes.com/20/lanews/la-ed-0808-delta-conservation-plan-20120808/10>)

The editorial fails to mention that the Southern California ratepayers who will pay for the tunnels are among the most vocal critics of the Bay Delta Conservation Plan (BDCP). The construction of two massive peripheral tunnels to export more water to corporate agribusiness will not only hasten the extinction of Central Valley salmon and Delta fish species and take fertile Delta farmland out of production, but it could also dramatically raise rates for Southern California water customers.

A groundbreaking economic analysis released on August 7 by Food & Water Watch reveals that Los Angeles Department of Water and Power (LADWP) customers could be on the line for \$2,003 to \$9,182 per customer to pay for the 37-mile Peripheral Tunnels project announced by Governor Jerry Brown on July 25.

California Water Impact Network (C-WIN) President Carolee Krieger urges Angelinos to learn from Santa Barbara County's costly mistakes.

"In 1991, Santa Barbara County voters approved the Coastal Aqueduct at an estimated cost of \$270 million," said Krieger. "The aqueduct ended up costing nearly \$1.7 billion and has not been necessary to meet the County's water needs. California ratepayers and taxpayers should expect the same bad deal with the Peripheral Tunnels."

Krieger said most of the cost burden will fall on taxpayers and urban water ratepayers, although corporate agribusiness will receive the majority of the water from the tunnels through the Kern County Water Agency and Westlands Water District. While this taxpayer-subsidized water is intended for farming, an increasing amount of this water is being sold to real estate developers at large profits.

"Water agencies like LADWP are at a crossroads of whether to invest in the failed engineered solutions of the past or invest in the future, which provides local water and local jobs," said Conner Everts, the executive director of the Southern California Watershed Alliance. "This report shows the true cost of speculating on faraway infrastructure and illustrates why we should instead cost-effectively reduce demand here in L.A. first."

ECONorthwest's white paper analyzes the impacts that the costs of building and operating the tunnels would have on LADWP ratepayers. It outlines a low-cost scenario of \$20.6 billion, and a high-cost scenario of \$47.2 billion. For each, they evaluate the costs if the state and federal water projects evenly split the costs of the tunnel and related activities, and if the state project paid 100 percent.

This analysis does not take into consideration the environmental mitigation and other related expenses that will be left for California taxpayers to cover, which is estimated to cost between \$3 and \$5 billion.

The analysis concludes with an overview of local water supply alternatives' potential and costs.

"The most reliable water is water that we save and obtain from our local communities," said Kristin Lynch, Pacific Region director of Food & Water Watch. "LADWP is already planning on importing less water from the delta and maximizing local supplies despite projected population increases. These tunnels represent failed policies of the last century. L.A. has already embraced modern, smart water solutions and can't afford the Governor's archaic, wasteful pipedream."

The tunnel plan is a bad deal for salmon, Delta farmers and Southern California ratepayers. The LA Times, rather than saying "Give the Bay Delta Conservation Plan a chance," should proclaim, "Give salmon, the Delta and Southern California ratepayers a chance."

To download the report, go to: <http://documents.foodandwaterwatch.org/doc/BayDeltaConveyanceLAEconAnalysis.pdf>

**Mike Henry, Assistant Executive Director**

**California Farm Water Coalition**

6133 Freeport Blvd.

2nd Floor

Sacramento, CA 95822

(916) 391-5030

[www.farmwater.org](http://www.farmwater.org)

**From:** Karen Clark  
**Sent:** Friday, August 17, 2012 7:51 AM  
**To:** Bernhardt, David L.  
**Subject:** Conference Call on Monday

Hi David,

Regarding this morning's call, I need to schedule a conference call on Monday. Do you know who else should be on the call? Additionally, let me know when you are available on Monday.

Thanks so much.

*~Karen*

Karen Clark  
Executive Assistant to Thomas W. Birmingham  
Westlands Water District  
P.O. Box 6056  
Fresno, CA 93710  
(c) [REDACTED]  
(f) 559.241.6277  
Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)



**From:** Bernhardt, David L.  
**Sent:** Friday, August 17, 2012 7:57 AM  
**To:** 'Karen Clark'  
**Subject:** RE: Conference Call on Monday

I could do it anytime on Monday, until 1:30 my time. After that I am not available. I could also do it any time on Wend, if that works better.

---

**From:** Karen Clark [mailto:kclark@westlandswater.org]  
**Sent:** Friday, August 17, 2012 10:51 AM  
**To:** Bernhardt, David L.  
**Subject:** Conference Call on Monday

Hi David,

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Thanks so much.

*~Karen*

Karen Clark  
Executive Assistant to Thomas W. Birmingham  
Westlands Water District  
P.O. Box 6056  
Fresno, CA 93710  
(c) [REDACTED]  
(f) 559.241.6277  
Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Karen Clark  
**Sent:** Friday, August 17, 2012 7:59 AM  
**To:** 'Bernhardt, David L.'  
**Subject:** RE: Conference Call on Monday

Did Tom mention who else he wants to be on this call?

*~Karen*

Karen Clark  
Executive Assistant to Thomas W. Birmingham  
Westlands Water District  
P.O. Box 6056  
Fresno, CA 93710  
(c) [REDACTED]  
(f) 559.241.6277  
Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

---

**From:** Bernhardt, David L. [mailto:DBernhardt@BHFS.com]  
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**Subject:** RE: Conference Call on Monday

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(f) 559.241.6277  
Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Bernhardt, David L.  
**Sent:** Friday, August 17, 2012 8:11 AM  
**To:** Karen Clark  
**Subject:** Re: Conference Call on Monday

Jason.

David Bernhardt  
[REDACTED]

On Aug 17, 2012, at 10:59 AM, "Karen Clark" <[kclark@westlandswater.org](mailto:kclark@westlandswater.org)> wrote:

Did Tom mention who else he wants to be on this call?

*~Karen*

Karen Clark

Executive Assistant to Thomas W. Birmingham

Westlands Water District

P.O. Box 6056

Fresno, CA 93710

(c) [REDACTED]

(f) 559.241.6277

Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

---

**From:** Bernhardt, David L. [mailto:DBernhardt@BHFS.com]  
**Sent:** Friday, August 17, 2012 7:57 AM  
**To:** 'Karen Clark'  
**Subject:** RE: Conference Call on Monday

I could do it anytime on Monday, until 1:30 my time. After that I am not available. I could also do it any time on Wend, if that works better.

---

**From:** Karen Clark [mailto:kclark@westlandswater.org]

**Sent:** Friday, August 17, 2012 10:51 AM

**To:** Bernhardt, David L.

**Subject:** Conference Call on Monday

Hi David,

Regarding this morning's call, I need to schedule a conference call on Monday. Do you know who else should be on the call? Additionally, let me know when you are available on Monday.

Thanks so much.

*~Karen*

Karen Clark

Executive Assistant to Thomas W. Birmingham

Westlands Water District

P.O. Box 6056

Fresno, CA 93710

(c) [REDACTED]

(f) 559.241.6277

Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Karen Clark  
**Sent:** Friday, August 17, 2012 8:24 AM  
**To:** Peltier Jason  
**Subject:** Conference Call with Dave Bernhardt and Tom

Hi Jason,

When are you available next Monday for a conference call with Tom and Dave?

*~Karen*

Karen Clark

Executive Assistant to Thomas W. Birmingham

Westlands Water District

P.O. Box 6056

Fresno, CA 93710

(c) [REDACTED]

(f) 559.241.6277

Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Jason Peltier  
**Sent:** Friday, August 17, 2012 8:31 AM  
**To:** 'Karen Clark'  
**Subject:** RE: Conference Call with Dave Bernhardt and Tom

Am till 10:40 ok, then I have conflicts with State Board Member meetings 11-12, 1-2, and 3-4. I can miss any one of those tho. Important!

Need Judge Manson on the call if possible.

---

**From:** Karen Clark [mailto:kclark@westlandswater.org]  
**Sent:** Friday, August 17, 2012 8:24 AM  
**To:** Peltier Jason  
**Subject:** Conference Call with Dave Bernhardt and Tom

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When are you available next Monday for a conference call with Tom and Dave?

*~Karen*

Karen Clark  
Executive Assistant to Thomas W. Birmingham  
Westlands Water District  
P.O. Box 6056  
Fresno, CA 93710  
(c) [REDACTED]  
(f) 559.241.6277  
Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Tom Birmingham

**Sent:** Monday, August 27, 2012 10:00 AM

**To:** 'Don Peracchi'; 'Daniel Errotabere'; 'Donald Devine'; 'Frank Coelho, Jr.'; 'Gary Esajian'; 'Larry Enos'; 'Todd Neves'; 'Sarah Clark Woolf'; asano@westlandswater.org

**CC:** 'Craig Manson'; 'Bernhardt, David L.'; 'Mathews, Mark J.'

**Subject:** FW: Response to Your letter of July 19

**Attachments:** Birmingham Letter.pdf

I received the attached letter on Friday.

---

**From:** Stevenson, Richard M [mailto:RStevenson@usbr.gov]

**Sent:** Friday, August 24, 2012 3:00 PM

**To:** tbirmingham@westlandswater.org

**Cc:** Tom Glover; Glaser, Donald R; Jackson, Michael P.; Arroyave, Pablo R

**Subject:** Response to Your letter of July 19

Tom,

Attached you will find my response on behalf of the Bureau of Reclamation to your letter of July 19, 2012 addressed to me. Should you have questions regarding the response please contact me at the number below.



*Richard M. Stevenson*

*Deputy Regional Resources Manager*

*MP-400*

*(916) 978-5264*

*(916) 978-5290 (fax)*

[rstevenson@usbr.gov](mailto:rstevenson@usbr.gov)



# United States Department of the Interior

BUREAU OF RECLAMATION  
Mid-Pacific Regional Office  
2800 Cottage Way  
Sacramento, California 95825-1898

IN REPLY  
REFER TO:  
MP-400  
WTR-4.10

AUG 24 2012

Mr. Thomas W. Birmingham  
General Manager  
Westlands Water District  
P. O. Box 6056  
Fresno, California 93703-6056

Re: Drainage Repayment Contract Negotiations Between the United States Bureau of Reclamation ("Reclamation") and Westlands Water District ("Westlands")—Central Valley Project (CVP), California

Dear Mr. Birmingham:

I am writing to respond to your letter of July 19, 2012. In that letter you state "Westlands does not understand the need for an executed repayment contract in order for Reclamation to meet its control schedule", and that Article 16 (c) of the 2007 Interim Renewal Contract [as amended by the 2010 and 2012 interim renewal contracts] "should suffice to provide a repayment mechanism for any contemplated drainage work within Westlands."

For the reasons set forth below, Reclamation disagrees with Westlands' position regarding the sufficiency of the current repayment mechanism to recover the costs of the drainage collector system.

Reclamation and Westlands have been negotiating the terms and conditions of a 9 (d) repayment contract for over two years – including numerous negotiation sessions spanning the period from June 23, 2010 to March 9, 2012, some of which were public – but until your July 19 letter, Reclamation was unaware that Westlands believes the 2007 Interim Renewal Contract provides a suitable mechanism for recovery of the costs of the drainage collector system.

As you acknowledge, the Reclamation Project Act of 1939 ("the 1939 Act"), sections 9(d) and 9(e), govern repayment of irrigation facilities. Section 9(d) "repayment" contracts are a general repayment obligation for fixed costs of any irrigation project, new division or supplemental works, including distribution systems and other local facilities, such as the drainage collector system. Section 9(e) "water service contracts", on the other hand, are discretionary, to be used in lieu of 9(d), and are generally limited to water supply works. In the CVP they have been used for repayment of multi-purpose storage facilities (i.e., irrigation and flood or salinity control, or fish and wildlife), or multi-user storage facilities (i.e., main CVP facilities). The drainage facilities in question are not water supply works, and are neither multi-purpose, nor multi-user



works. They are single purpose, single user, local facilities and, therefore, Reclamation believes the appropriate repayment mechanism is a 9(d) repayment contract.

Section 8 of the San Luis Act states: “. . . no funds shall be appropriated for construction of distribution systems and drains prior to ninety calendar days . . . after a contract has been submitted to the Congress calling for complete repayment of the distribution systems and drains within a period of forty years from the date such works are placed in service.”

The fundamental statutory requirement, therefore, is that Congress must be presented with a contract that demonstrates to the satisfaction of the Congress, that the amount to be repaid will in fact be repaid within a term of 40 years. The best method of demonstrating the highest probability of repayment is through a repayment contract executed under the authority of section 9 (d) of the Reclamation Projects Act of 1939. Repayment of the Westlands distribution system and some basic components of the drainage collector system is currently being accomplished through a repayment contract. Reclamation-wide, recovery of distribution system and related costs has consistently been accomplished through 9 (d) contracts. Reclamation is unaware of any reason that the cost of the drainage collector system cannot, and should not, be repaid under a 9 (d) repayment contract. Such a contract has the benefit of known, fixed payments over a definite period of time, thereby removing the inherent uncertainty of repayment under a water service contract utilizing the CVP irrigation rate-setting policy. The benefit of this certainty accrues to both parties to the contract.

On the other hand, Westlands current interim renewal water service contract has only 18 months remaining in its term. It is likely that additional two-year interim renewal contracts will be required before it becomes possible for Reclamation and Westlands to sign a long-term water service contract. When it is possible for a long-term contract to be executed, the maximum term of that contract will be 25 years under current law. Neither of these situations satisfies Reclamation standards for a good conscience submittal to Congress of a contract which suffices to demonstrate complete repayment of the Westlands drainage collector system as directed by Section 8 of the San Luis Act.. The assurance of complete repayment demanded by Congress can only be provided by a 9 (d) repayment contract. Reclamation has consistently taken the position that it cannot begin construction of the drainage collector facilities before we have a 9(d) repayment contract executed by Westlands.

Reclamation has previously sent Westlands a proposed draft form of contract and follow-up letters dated March 21, 2012 and July 6, 2012. To date, we have not received a substantive response from Westlands as to the form of that contract or to the prior letters. Reclamation has been proceeding in good faith to meet the control schedule requirements and requests a substantive written response to our prior letters within 30 days of the date of this letter.

If you have questions, please contact Angela Slaughter at 916-978-5250, or by email at [aslaughter@usbr.gov](mailto:aslaughter@usbr.gov).

Sincerely,

A handwritten signature in blue ink, appearing to read "Richard M. Stevenson", is written over the printed name.

Richard M. Stevenson  
Deputy Regional Resources Manager

**From:** Jason Peltier

**Sent:** Wednesday, August 29, 2012 8:59 AM

**To:** Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLOYD Fryer; Martin McIntyre; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheehan,Rebecca D; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** FW: Outlandish

---

**From:** Mike Henry [mailto:mhenry@farmwater.org]

**Sent:** Wednesday, August 29, 2012 8:52 AM

**To:** Jason Peltier

**Subject:** Outlandish

Jason...several of those "draining the river" type comments in this post:

## Peripheral Canal: Get It Right or Don't Do It

**Author:** Victor Gonella

September, 2012 Issue

North Bay biz

On June 22, 12 U.S. Congress members, all from Northern California, sent a letter to Interior Secretary Ken Salazar and acting Commerce Secretary Rebecca Blank. They asked the secretaries to withhold their support for Governor Jerry Brown's plan to build a peripheral canal that could destroy much of the Sacramento Bay Delta and the commercially valuable salmon runs that transit the delta annually. The signing members include those representing salmon fishermen in Bodega Bay, San Francisco, Sausalito, Half Moon Bay and other Bay Area ports.

The peripheral canal's primary purpose is to interrupt the natural flow of the Sacramento River, reroute it around the environmentally sensitive delta, and deliver it to federal and state pumps that move water south to corporate agricultural operations on the western side of California's San Joaquin Valley and to Southern California cities.

The state is proposing to build the canal project without first doing basic calculations to determine how much water it needs to leave in the river and delta to keep salmon, other wildlife and the delta alive. Without this calculation, it's not clear how much water might be safely available for diversion and export. And without that information, the state can't right-size the canal.

Currently, the state is supporting a canal big enough to drain the entire Sacramento River at most times of year. This mega-canal was dreamed up by the water users at the receiving end of the pipe, waiting to turn water into hard cash. At this size, the canal is a nonstarter for those whose jobs are tied to healthy salmon runs. Salmon industry workers (think commercial fishermen, boat dealerships, seafood processors, chefs, restaurants, tackle shops, marinas and the like), delta farmers and others know an oversized canal will not only kill salmon but will also leave little more than a stagnant sewer in the delta for local farmers to draw from.

The 12 opposing members of Congress say the plan to build the peripheral canal "raises far more questions than it answers and appears to turn the maxim of 'policy before plumbing' on its head."

Huge water diversions in the Sacramento/Bay Delta between 2000 and 2006 were finally stemmed by court order, but only

after causing salmon runs to collapse, leading to the first-ever California ocean salmon fishing closures in 2008 and 2009. Those closures brought the \$1.4 billion salmon industry to its knees. Recent federal water diversion restrictions are a first step toward a fully restored salmon fishery, which could eventually yield more than \$5 billion in annual economic activity, according to a review of state and federal data by the Southwick Economics firm.

The National Academy of Sciences has looked at the peripheral canal proposal and issued a scathing review, saying that, so far, the scientific analysis is wholly inadequate. Officials with the National Marine Fisheries Service, U.S. Fish and Wildlife Service and California Department of Fish and Game have all issued red-flag warnings about the biological damage the current project threatens. The Golden Gate Salmon Association supports these findings. Among other things, current plans largely ignore legal requirements to accommodate federally protected species in the delta. Forging ahead on an ill-conceived canal provides a fat target for lawsuits.

Then there's the issue of who's going to get stuck with the multibillion dollar bill. A recent analysis by the University of Pacific's Eberhardt School of Business, Business Forecasting Center says the costs would outweigh benefits by 2.5 times if you consider costs the public will bear. The benefits will accrue mostly to a small group of agricultural operators who will receive publicly subsidized water. The rest of us will pay—one way or another. So far, the state has refused to do a statewide cost benefit analysis for this massive public works project.

More worrisome to average Southern Californians, canal planning documents suggest that western San Joaquin Valley agriculture operations, which are expected to reap 75 percent of the benefits, could pay for only 25 percent of the costs. Might the other 75 percent of the costs be shifted to urban water users in Southern California? Or will it be shared by public users across the state?

Canal proponents currently call for more water in the critical months of August and September, exactly when adult salmon migrate in from the sea to spawn in the Sacramento River. Salmon need cold water to successfully spawn, something canal planners have apparently overlooked. These same planners say they aren't responsible for the upstream carnage their project might create. If that's true, then who is?

What's more, scientists routinely predict that climate disruption will impact California—its coastline, sea level, weather patterns, precipitation rates and a growing list of other conditions. The currently proposed plan indicates climate assumptions will be “forthcoming.”

The 12 members of the California Congressional Delegation who signed the petition requested that Governor Brown not proceed with the canal until his administration answers basic questions. Full disclosure should be provided to all Californians and every taxpayer and Southern California ratepayer. Absent a responsible policy firmly in place, this proposal looms as a giant recipe for disaster, not one for reliable, ecologically appropriate water service.

*Victor Gonella is president of the Golden Gate Salmon Association <<http://goldengatesalmonassociation.com>> . Contact him at (707) 765-3073 or [victor@ggsa.com](mailto:victor@ggsa.com).*

**Mike Henry, Assistant Executive Director**

**California Farm Water Coalition**

6133 Freeport Blvd.

2nd Floor

Sacramento, CA 95822

(916) 391-5030

[www.farmwater.org](http://www.farmwater.org)

**From:** Ara Azhderian

**Sent:** Wednesday, August 29, 2012 12:16 PM

**To:** Jason Peltier; Allison Dvorak Febbo; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; Dan Nelson; Dan Keppen; David Bernhardt; Ed Manning; Frances Mizuno; Gayle Holman; Greg Zlotnick; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLOYD Fryer; Martin McIntyre; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheehan,Rebecca D; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'; Joe McGahan; Jon Rubin

**Subject:** RE: Outlandish

Yes sir. A couple thoughts for the Doozies group:

- 1) "interrupt the natural flow of the Sacramento River" – The Sacramento River hasn't had "natural" flows since the Gold Rush. The most dramatic and rapid changes occurred with the flood control era in the 19teens (eg 1917 Sacramento Flood Control System). Water/power supply projects operations followed decades later. What the BDCP does propose is to divert some volume of water (DWR has a good illustration of this) from the Sacramento river when flows are high – commonly referred to as "big gulp" – long considered by State and federal fish agencies as an environmentally superior mode of operation.
- 2) "Without this calculation, it's not clear how much water might be safely available for diversion and export." – This question will be answered prior to operation of new conveyance – it is essentially the reason for Decision Tree.
- 3) "the state is supporting a canal big enough to drain the entire Sacramento River at most times of year." This is a bald face lie. The proposed north Delta diversions have, since day 1, minimum bypass thresholds and operational ramp-up parameters that make this impossible.
- 4) "but only after causing salmon runs to collapse" – According to analysis conducted by the Pacific Fisheries Management Council, the body charged with establishing salmon harvest recommendations, projects' operations was not the cause of the latest decline in salmon populations ("In 2005, the volume of water pumped from the Delta reached record levels in January before falling to near-average levels in the spring, then rising again to near-record levels in the summer and fall (Fig. 5,top), but only after the migration of fall Chinook smolts was nearly complete (Fig. 8). Water diversions, in terms of the export:inflow ratio (E/I), fluctuated around the average throughout the winter and spring (Fig. 5,bottom)" - [http://www.pcouncil.org/bb/2009/0409/H2b\\_WGR\\_0409.pdf](http://www.pcouncil.org/bb/2009/0409/H2b_WGR_0409.pdf)). PRMC and NMFS both concluded that ocean conditions are proximate cause. This was also true for the previous decline in the late 80's. Ironically, NMFS also pointed to "high stream flows in 2005" as a potential contributor - <http://swfsc.noaa.gov/publications/FED/00994.pdf> and PFMC noted that flows between 2000-05 were wetter than average and didn't result in increased salmon population as folklore would dictate.)
- 5) "have all issued red-flag warnings" – setting aside arguments about the "red-flag" issues, the project has been changed since then and NMFS stated at the press conference that the current proposed addresses/satisfies the "red-flag" concerns.
- 6) "costs would outweigh benefits by 2.5 times if you consider costs the public will bear" – Clearly there are contradicting views regarding financial benefits, which continue to be analyzed because answering the question ultimately is unavoidable as no rate payer or bond investor would move forward without it. This argument, and cost allocation speculation, are a noisy, unfortunate distraction.
- 7) "These same planners say they aren't responsible for the upstream carnage their project might create." It would be interesting to know to whom the author is referring because upstream considerations drive much of the proposal. My guess is that this is a made up assertion.

Anyway, tons of other usual annoyances (eg "corporate ag") but here's some ammo I hope helps.

Have fun,  
ara

---

**From:** Jason Peltier [mailto:jpeltier@westlandswater.org]

**Sent:** Wednesday, August 29, 2012 9:00 AM

**To:** Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; Dan Nelson; Dan Keppen; David Bernhardt; Ed Manning; Frances Mizuno; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLoyd Fryer; Martin McIntyre; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheehan,Rebecca D; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** FW: Outlandish

---

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**Sent:** Wednesday, August 29, 2012 8:52 AM

**To:** Jason Peltier

**Subject:** Outlandish

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*Victor Gonella is president of the Golden Gate Salmon Association <<http://goldengatesalmonassociation.com>> . Contact him at (707) 765-3073 or [victor@ggsa.com](mailto:victor@ggsa.com).*

**Mike Henry, Assistant Executive Director**  
**California Farm Water Coalition**

6133 Freeport Blvd.  
2nd Floor  
Sacramento, CA 95822  
(916) 391-5030  
[www.farmwater.org](http://www.farmwater.org)

**From:** Jason Peltier

**Sent:** Thursday, August 30, 2012 10:23 PM

**To:** 'Karen Clark'; 'Alison MacLeod'; 'Carmela McHenry'; 'Carolyn Jensen'; 'Catherine Karen'; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Joe Findaro'; 'Mike Burns'; 'Susan Ramos'; 'Tony Coelho'; T Birmingham

**Subject:** Friday am call on

Please join if you can at 7:30 am.

Usual number.



**From:** Ed Manning

**Sent:** Thursday, August 30, 2012 10:28 PM

**To:** 'jpeltier@westlandswater.org'; 'kclark@westlandswater.org'; Alison MacLeod; Carmela McHenry; Carolyn Jensen; 'ckaren@sidley.com'; 'dbernhardt@bhfs.com'; Doug Subers; 'gholman@westlandswater.org'; 'joe.findaro@akerman.com'; Michael Burns; 'sramos@westlandswater.org'; 'tony@onewharf.com'; 'tbirmingham@westlandswater.org'

**Subject:** Re: Friday am call on

Last day of session. Won't be. On the call.

---

**From:** Jason Peltier [mailto:jpeltier@westlandswater.org]

**Sent:** Thursday, August 30, 2012 10:23 PM

**To:** 'Karen Clark' <kclark@westlandswater.org>; Alison MacLeod; Carmela McHenry; Carolyn Jensen; 'Catherine Karen' <ckaren@sidley.com>; 'David Bernhardt' <dbernhardt@BHFS.com>; Doug Subers; Ed Manning; 'Gayle Holman' <gholman@westlandswater.org>; 'Joe Findaro' <joe.findaro@akerman.com>; Michael Burns; 'Susan Ramos' <sramos@westlandswater.org>; 'Tony Coelho' <tony@onewharf.com>; T Birmingham <tbirmingham@westlandswater.org>

**Subject:** Friday am call on

Please join if you can at 7:30 am.

Usual number.

**From:** Karen, Catherine  
**Sent:** Thursday, August 30, 2012 10:34 PM  
**To:** jpeltier@westlandswater.org  
**Subject:** Re: Friday am call on

Hi Jason,  
I will try. Flying back from Tampa.

---

**From:** Jason Peltier [mailto:jpeltier@westlandswater.org]  
**Sent:** Friday, August 31, 2012 12:23 AM  
**To:** 'Karen Clark' <kclark@westlandswater.org>; 'Alison MacLeod' <amacleod@ka-pow.com>; 'Carmela McHenry' <cmchenry@ka-pow.com>; 'Carolyn Jensen' <cjensen@ka-pow.com>; Karen, Catherine; 'David Bernhardt' <dbernhardt@BHFS.com>; 'Doug Subers' <dsubers@ka-pow.com>; 'Ed Manning' <emanning@ka-pow.com>; 'Gayle Holman' <gholman@westlandswater.org>; 'Joe Findaro' <joe.findaro@akerman.com>; 'Mike Burns' <mburns@ka-pow.com>; 'Susan Ramos' <sramos@westlandswater.org>; 'Tony Coelho' <tony@onewharf.com>; T Birmingham <tbermingham@westlandswater.org>  
**Subject:** Friday am call on

Please join if you can at 7:30 am.

Usual number.

-----  
IRS Circular 230 Disclosure: To comply with certain U.S. Treasury regulations, we inform you that, unless expressly stated otherwise, any U.S. federal tax advice contained in this communication, including attachments, was not intended or written to be used, and cannot be used, by any taxpayer for the purpose of avoiding any penalties that may be imposed on such taxpayer by the Internal Revenue Service. In addition, if any such tax advice is used or referred to by other parties in promoting, marketing or recommending any partnership or other entity, investment plan or arrangement, then (i) the advice should be construed as written in connection with the promotion or marketing by others of the transaction(s) or matter(s) addressed in this communication and (ii) the taxpayer should seek advice based on the taxpayer's particular circumstances from an independent tax advisor.

\*\*\*\*\*  
\*\*\*\*\*

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\*\*\*\*\*  
\*\*\*\*\*

**From:** Bernhardt, David L.  
**Sent:** Friday, August 31, 2012 2:37 AM  
**To:** Jason Peltier  
**Subject:** Re: Friday am call on

Jason: I'll be on a flight, Ryan will be on the call.

David Bernhardt  


On Aug 31, 2012, at 1:23 AM, "Jason Peltier" <[jpeltier@westlandswater.org](mailto:jpeltier@westlandswater.org)> wrote:

Please join if you can at 7:30 am.

Usual number.

**From:** Jason Peltier

**Sent:** Friday, August 31, 2012 7:12 AM

**To:** 'Karen Clark'; 'Alison MacLeod'; 'Carmela McHenry'; 'Carolyn Jensen'; 'Catherine Karen'; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Joe Findaro'; 'Mike Burns'; 'Susan Ramos'; 'Tony Coelho'; T Birmingham

**Subject:** For 7:30 call

Call-in # 800-██████ code ██████

FYI:

## Notes from the Bay-Delta Conservation Plan public meeting, August 29th, 2012

[30. August 2012](#) · [Write a comment](#) · Categories: [Water](#) · Tags: [Bay Delta Conservation Plan](#), [Delta](#)

*The following is a rundown of what happened at the Bay-Delta Conservation Plan public meeting held on August 29th, 2012. These are highlights only, and is a record of most of what happened; however, it is not meant to be a complete record or a complete transcript of the meeting. I listened in on the conference call, which is why individual speakers aren't identified; without visuals, I cannot confirm who is speaking in most instances.*

### **PRESENTATIONS**

Meral opens with an update: Dr. Jerry Meral, Secretary of Natural Resources, started the meeting with an update on the status of the project. The revised proposed conveyance facilities are 40% smaller than the facilities proposed in February and now consist of three intakes with a cumulative capacity of 9,000 cfs. The water will be conveyed by gravity flow through twin tunnels rather than being pumped. The project proposes over 100,000 acres of restored habitat, the majority being tidal habitat, so far the leading candidate for recovery of covered species. While progress on the BDCP has been made, there are still a lot of remaining issues, including reservoir releases and upstream temperatures, how and where the intakes should be located, and how the project will be financed. The governance of the project continues to evolve with local counties wanting to be included in the decision making process. Residents of Courtland and Hood have many concerns about impacts of the project on their communities; staff is working with them to resolve these issues. Meral also said they were working on an expedited process for landowners to resolve concerns about project impacts. Meral emphasized that it is a 'preferred project' not the selected project, and no final decision has been made or can be made until the environmental work has been completed.

More on the new facilities: Russ Stein, Department of Water Resources, discussed the new conveyance facilities. The preferred alternative is based on Alternative 4. For intake locations, they are currently looking at intake locations 2, 3, and 5, but there are 7 potential locations along the Sacramento River and nothing has been ruled out as of yet. The intakes will feature state-of-the-art fish screens. The intakes are 3,000 cfs each; the largest fish screens ever built have been for 3,000 cfs; additionally, larger capacity intakes would have to be longer, thereby making it more difficult for the juvenile salmonids to get past. After the intakes, the water will flow into sedimentation basins and then into an intermediate forebay; from there, the water would travel 35 miles through the tunnels down to a 840-acre forebay around Byron Tract where it could be conveyed to either the Jones Pumping Plant (CVP) or Clifton Court (SWP). The tunnels will convey the water by gravity flow, which will reduce greenhouse gases and require less transmission lines to be installed. This alternative would require 50 MW of power instead of 200 MW, a substantial savings in energy. The total footprint of the revised

project is 2700 acres. The use of the south Delta facilities will be retained, so water will be able to be diverted at either point.

Biological Goals and Objectives: David Zippin and Jennifer Pierre talked about the importance of biological goals and objectives. Biological goals and objectives serve three purposes: they articulate the desired outcomes, they describe how the outcomes will contribute to the recovery of covered species, and they provide benchmarks for measuring progress. Since February, they have been working with fish and wildlife agencies to incorporate their comments. Some goals and objectives are currently being refined including strategies for non-tidal marsh, cultivated lands, tidal and managed wetlands, and covered fish, specifically the Delta smelt, longfin smelt, and through-Delta survival of salmonids. Lamprey are included in the Plan's biological goals and objectives because they could potentially become listed species. They are also working on expanding the rationale for each objective.

Decision Tree Update: The decision tree is a new concept; it is a visual and analytical tool to be applied to Conservation Measure 1, the new facilities. The decision tree will be applied to initial operations once the new facilities are built and operational. A decision tree prescribes a decision based on specific criteria; the specific criteria lead to the selection of a specific outcome. Decision trees can incorporate multiple criteria and associated outcomes. Decision trees are needed and useful because scientific uncertainties existing now will be reduced by new studies and data that will occur during the 10 to 15 years it will take for the project to become operational. Decision trees are also being considered for determining spring and fall outflow. The criteria set by the decision tree that will be used to determine operations will be analyzed in the Effects Analysis. The decision tree will produce a range of potential operations that could occur; these ranges will be equally analyzed. The decision tree will establish the starting point; adaptive management will be used to modify operations as needed. The decision tree is currently under development; might be ready for review in September. A participant asked if when the permit is approved, will it include numbers for actual operations? Meral replied that there will be a range of numbers; numbers will have to be included in order for the permit to be approved.

Finance: David Zippin gave a brief presentation on the financing of the project. There are no new cost estimates at this time. Costs for conservation measures have been changing. Construction costs are up as the tunnel size for gravity flow needs to be larger, but operating and maintenance costs will be significantly less. Other cost estimates for conservation measures have changed as well. The upcoming Chapter 8 (Financing of the BDCP) will contain planning level estimates, identify and quantify likely funding sources, demonstrate that potential sources are adequate, and describe contingencies. Chapter 8 will not contain an operating budget, financing plan, or funding agreements. "Adequate funding" is a requirement of both NCCP and ESA regulations. Over 25 potential funding sources have been identified so far. They are working with the water contractors to fully define costs. The contractors have agreed to fully fund the new facilities and the mitigation for those facilities, plus a portion of mitigation beyond that; this is currently being discussed. The water bond continues to be an important source of funding. The proportional funding remains the same with roughly 75% of costs to be covered by the water contractors, 10% by Reclamation, 10% by the water bond, and 5% from other agencies, such as DFG, USFWS, and NMFS.

Schedule: Meral said the public draft of the BDCP and the EIR/EIS will be done in the fall, likely to be October. When exactly it will be ready depends on the success of the decision tree, and whether more modeling will need to be done as modeling drives the schedule. He will know more in September. At some point in the winter or early spring, the water contractors are going to have to make a commitment to fund the project and go forward. The final EIR/EIS could be approved and adopted in spring of 2013.

## **OTHER THINGS DISCUSSED ...**

Low-flow fish screens for the south Delta: The question was raised about screening the pumps in the south Delta for low-flow fish screens. Meral said that water agencies had studied the issue but had not released results of the study. A comment was made that low-flow screens are not appropriate for the south Delta facilities

because they are designed to take water from a river flowing by, but at the south Delta, the fish are at a dead end and there's no place for them to go, and by saving them from the pumps, they are instead subject to increased predation.

Tunnel size questioned: More than once, the size of the tunnels was questioned. Meral and staff said the tunnel will be a size that is capable of diverting 9,000 cfs by gravity. This will require a larger size tunnel than if the water were to be pumped; tunnels that would be pressurized need to be engineered for that, and these tunnels are not being engineered to be pressurized. Engineering for a pressurized tunnel increases construction costs significantly. The tunnels are not oversized for gravity feed, but they would be oversized if the tunnels were to be pressurized. A request was made for the specific diameter of the tunnels and whether those tunnels are larger or smaller than what was proposed in February, but the question could not be answered by staff. *"The tunnels will be designed to pass a 9,000 cfs flow; they won't be designed for a larger flow. What the tunnel diameter is, though, I don't know yet,"* Meral said.

"Suck the river dry": A participant said, regarding size/capacity of the proposed tunnels: *"I think they basically have the ability to suck the river dry if they wanted to."* Meral addressed the "suck the river dry" concerns, saying *"We're not very far above sea level. You could draw as much water as you want out of there and it will never be dry ... it physically can't be done. All you'd do is draw sea water in ... nobody's going to be seeing the bed of the Sacramento River; I'd like to put that one to rest."*

The Role of the Water Board: A commenter asked Meral to clarify the role of the State Water Resources Control Board. Meral said the Water Board is a cooperating agency working with them on the environmental work. The Water Board is proposing an alternative that will be considered as well. The Water Board must approve the change in the point of diversion, so the Water Board will have the final say whether the project goes forward.

Vague salmon objectives: A comment from a participant (possibly Dick Poole, GGSA): He has been reviewing the objectives for salmon; the objectives lack specific numbers, or are noted that "objective achieved by operational improvements". *"We'd like to comment on it but we're not seeing anything we can comment on,"* he said. Zippin responded that he was not sure what document they were reviewing, but he suspects they were placeholders for numbers that hadn't been developed yet. In most all of the cases, the numbers have been developed but haven't been released yet. Targets are still being discussed with the agencies. The commenter said that they'd been working on salmon issues for years, and he didn't think that operational improvements were going to do much of anything. Zippin replied that they weren't planning on solely relying on operational improvements.

Local concerns: One commenter said that with the decision tree, it's difficult analyze to the impact on local water supplies and local water quality. Local water users are concerned about bypass flows in the Sacramento River; tides are an influence as well. *"We don't have anything yet to rely on to come to any conclusion on that issue; we need more from you on that."* Jennifer Pierre said that water quality and supply will be evaluated in the Effects Analysis at the range of values provided by the decision tree, and the EIR will do more analysis on these issues as well.

Science versus muscle: One participant said we can all get lulled into thinking that science will provide all the answers, but there will always be some degree of scientific uncertainty. *"The problem is that when there is scientific uncertainty, it comes down to a battle of muscle trying to decide what we're going to do ... as long as there's a little bit of uncertainty, and the ability to get in there and claim the uncertainty, and then use political muscle to get an outcome that you want; we believe that's going to happen. Pushing that off into the future until after facilities are built is a risky proposition for Delta stakeholders."* Meral responded that so far, it seems the muscle has come down on the side of the fish agencies. *"The projects have been very constrained by the [endangered species] acts and of course by the water boards and water quality standards,"* Meral said. *"For those who are worried that the water projects or the water contractors will take advantage of the scientific*

*uncertainty to force a decision in their favor, I would say they would probably tell you – some of them are here and can speak for themselves – that they haven't been overly successful with that in the past ... history is that these projects have been highly constrained, exports have been dramatically reduced really by the operation of the acts in the face of a lot of protests and lawsuits by the water contractors, so ... the past is not an indication that muscle is going to overcome these acts.”*

Who will be in charge of Delta restoration: One participant questioned the role of the Delta Conservancy and others in leading restoration efforts: *“Who’s authorized to do what? Who’s going to be the lead agency? If it’s going to be the BDCP, there ought to be an announcement to that effect.”* Meral agreed that there are several agencies with an interest in Delta restoration efforts, but who will be in charge? *“My guess is that in the end, the agencies all work together. To say that one agency will dominate, like the Delta Conservancy or the Fish & Wildlife Service or someone else, I don’t think so. I think the key is that all the state and federal agencies and the NGOs just need to meet periodically and coordinate,”* said Meral.

**From:** Jason Peltier

**Sent:** Friday, August 31, 2012 7:19 AM

**To:** T Birmingham; Allison Dvorak Febbo; Ara Azhderian; B Walthall; BJ Miller; Brenda Burman; Byron Buck; Carolyn Jensen; Chris Beale; Clare Foley; Cliff Schulz; Curtis Creel; D Nelson; Dan Keppen; David Bernhardt; Ed Manning; frances.mizuno@sldmwa.org; Gayle Holman; Greg Zlotnick; Jason Peltier; Joe Findaro; Jon Rubin; Kear,Adam C; Laura King Moon; Laura Simonek; LLoyd Fryer; Martin McIntyre; Mike Henry; Mike Wade; Neudeck,Randall D; Philp,Thomas S; Rodriguez, Larry; Roger Patterson; Rose Schlueter; Sheehan,Rebecca D; Sheila Greene; Steve Arakawa; Sue Ramos; Terry Erlewine; Tom Boardman; Tom Glover; Tom Mongan; 'Valerie Connor'

**Subject:** latest mapping from Delta Dialogues attached

**Attachments:** delta-dialogues-2012-08-24.pdf





# **Delta Dialogues**

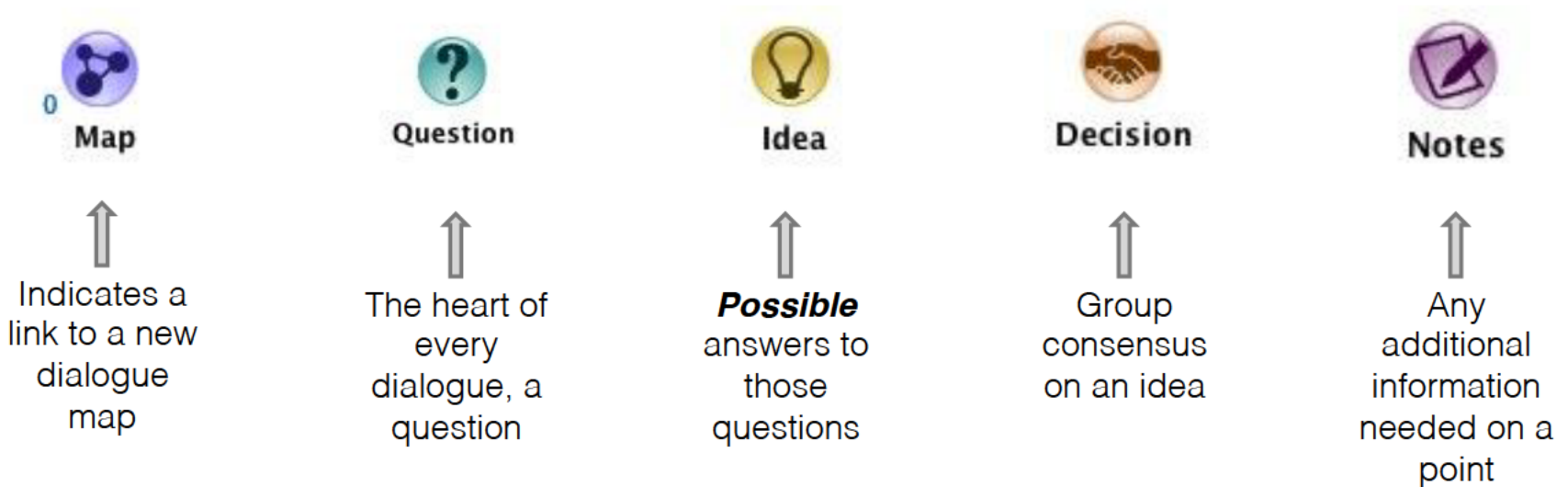
August 24, 2012

Clarksburg, CA

Hosted by the Delta Conservancy  
Facilitated by CogNexus and Groupaya

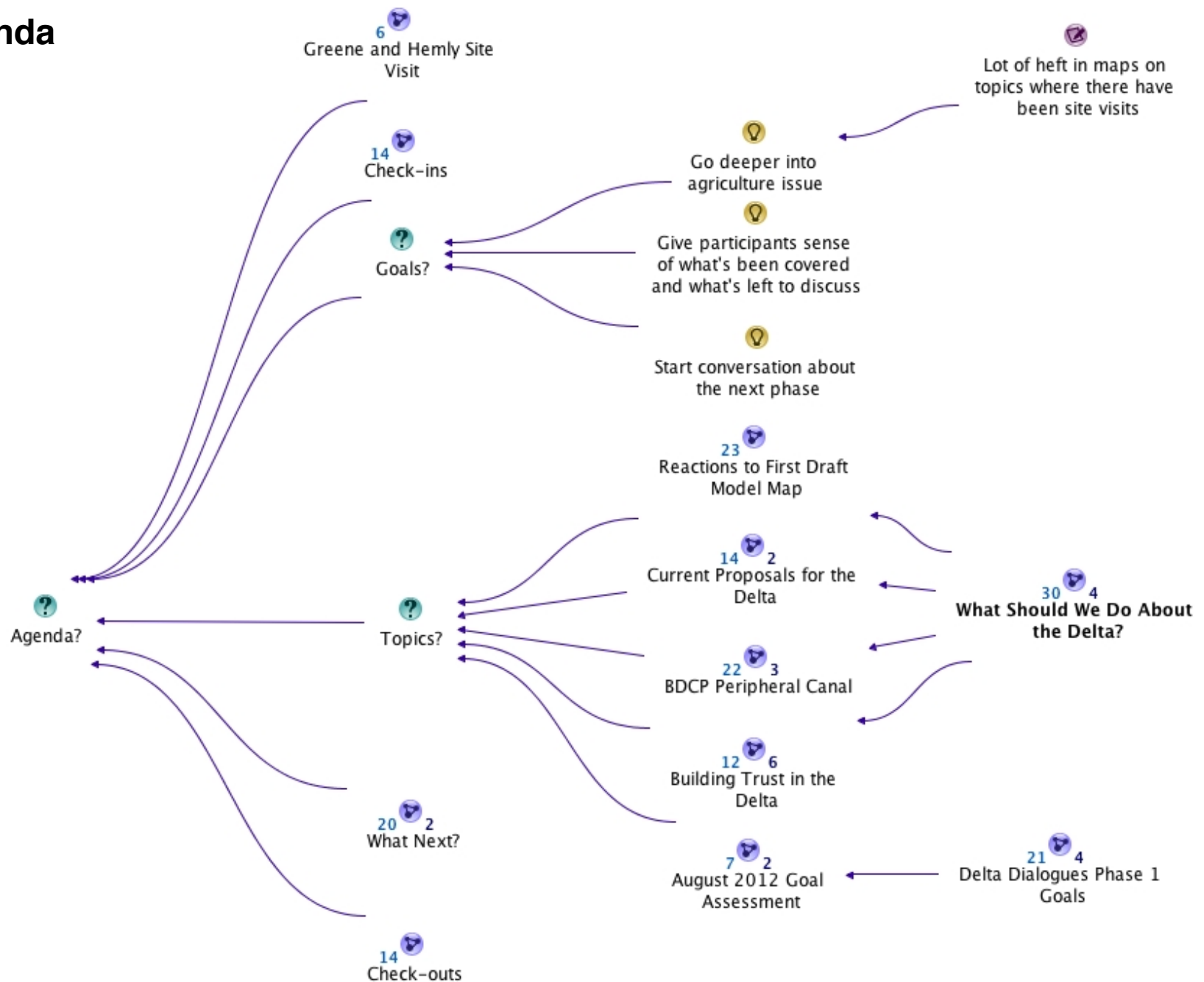
# How to Read the Maps

On the following pages you will find Dialogue Maps outlining the leadership conversation from August 24. The best way to read the maps is from left to right, from top to bottom. We use the following icons:



The numbers on the bottom left of the map icon represents the number of items inside that map. The numbers on the bottom right indicate how often that item appears in different maps.

# Agenda



# Check-ins



Frustration-induced clinical depression



Glad to be back. Thankful for participation in this morning's discussion. Enjoyed opportunity to present area



Nice to be in this area (Ground Zero), where everything's happening



Remain enthused and curious (and a little clinically depressed)



Haven't been around for awhile. Lot of many year's work in chaos. Feel frustrated, resigned, powerless. But not for long.



Full. Hopeful we can do some wine sampling before the end of the day



Morning was tremendously interesting. Could draw parallel with fishing industry, frustration that these folks are relating from a different industry



Glad we're continuing



Better informed. Like being able to see firsthand. Not just see it in word, but in expression, sit on home turf



Grateful there's continued interest in this process. Get a lot out of it. On the verge of being warm



Disappointed missing last meeting. Read people's summaries and sounded good. Felt bad was not there. Share frustration and hopefulness. Glad came on this field trip. Enjoyed hearing first-hand issues that we kind of know about but don't get right flavor until talk one-on-one with people who will be directly affected



Ready to re-engage having missed some meetings. Highly recommend vacation if you're clinically depressed. Really benefited from tour this morning. Enjoyed hearing first-hand perspective. What's at stake, passion really came through



Interested, hopeful, thankful for discussion



Happy to be here. Sorry missed last time (although enjoyed vacation). Unfortunate no agency types here last time. Could have had productive conversation. Had side field trip and productive conversation

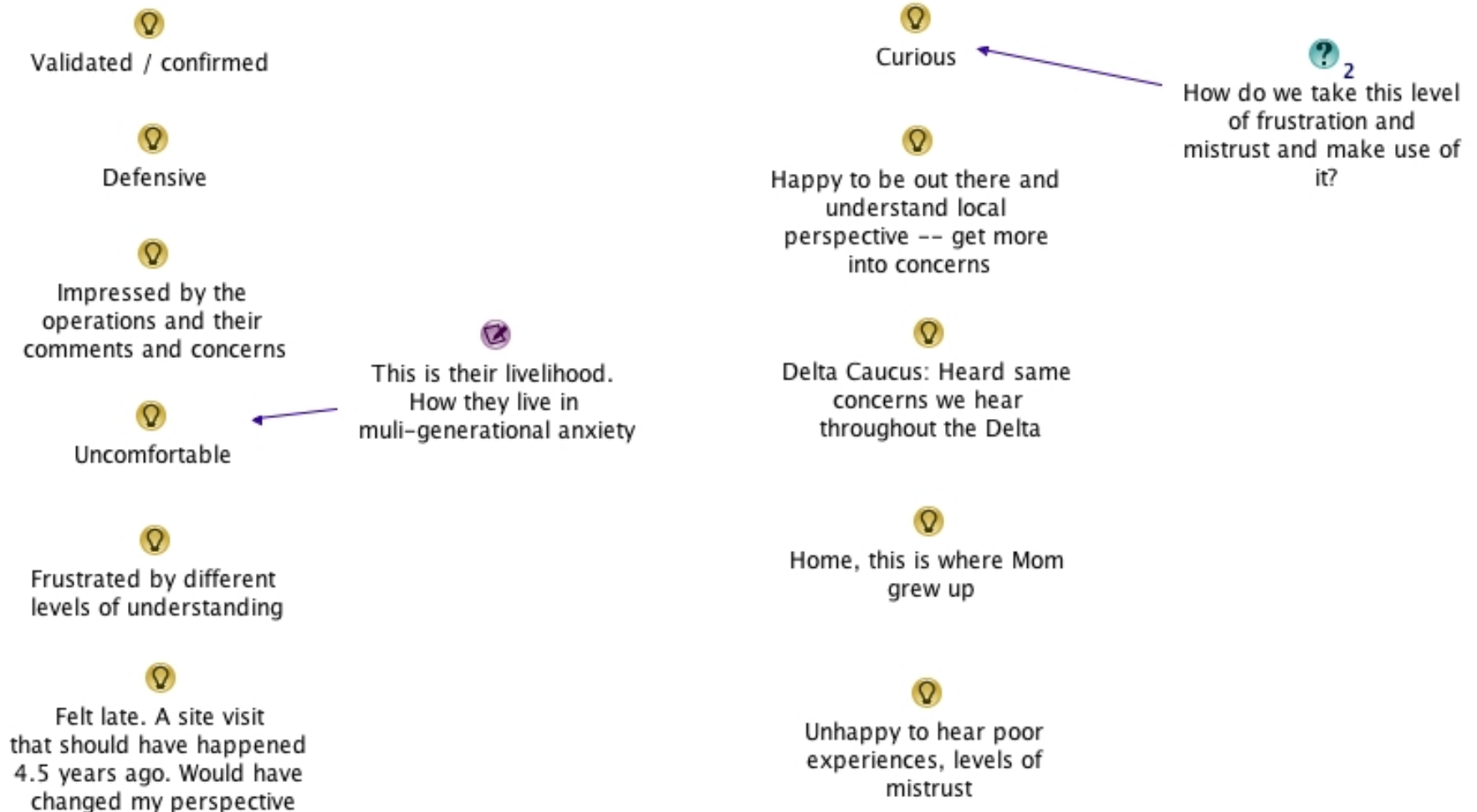


# Greene & Hemly Site Visit



# Greene & Hemly site visit

*What did you feel on the  
Greene and Hemly site visit?*



# Greene & Hemly site visit

*What did you sense on the  
Greene and Hemly site visit?*

💡  
Saw hardworking people  
earning their money

💡  
Everything they said and  
did was with passion

💡  
Remarkably clean facility

💡  
Delicious grapes

💡  
Hard work: Standing,  
sorting fast

💡  
All the communities that  
rely on that work

➕  
Speaks to commitment to  
what they do

💡  
Lot of investment in  
family, agriculture,  
business. Lot of room for  
growth

💡  
Sense of being extorted  
to do conservation

💡  
People can't sell land  
until uncertainty resolved

💡  
Diversity of crops. Not  
just pears and apples:  
all the different  
varieties and how that  
fits into the world market

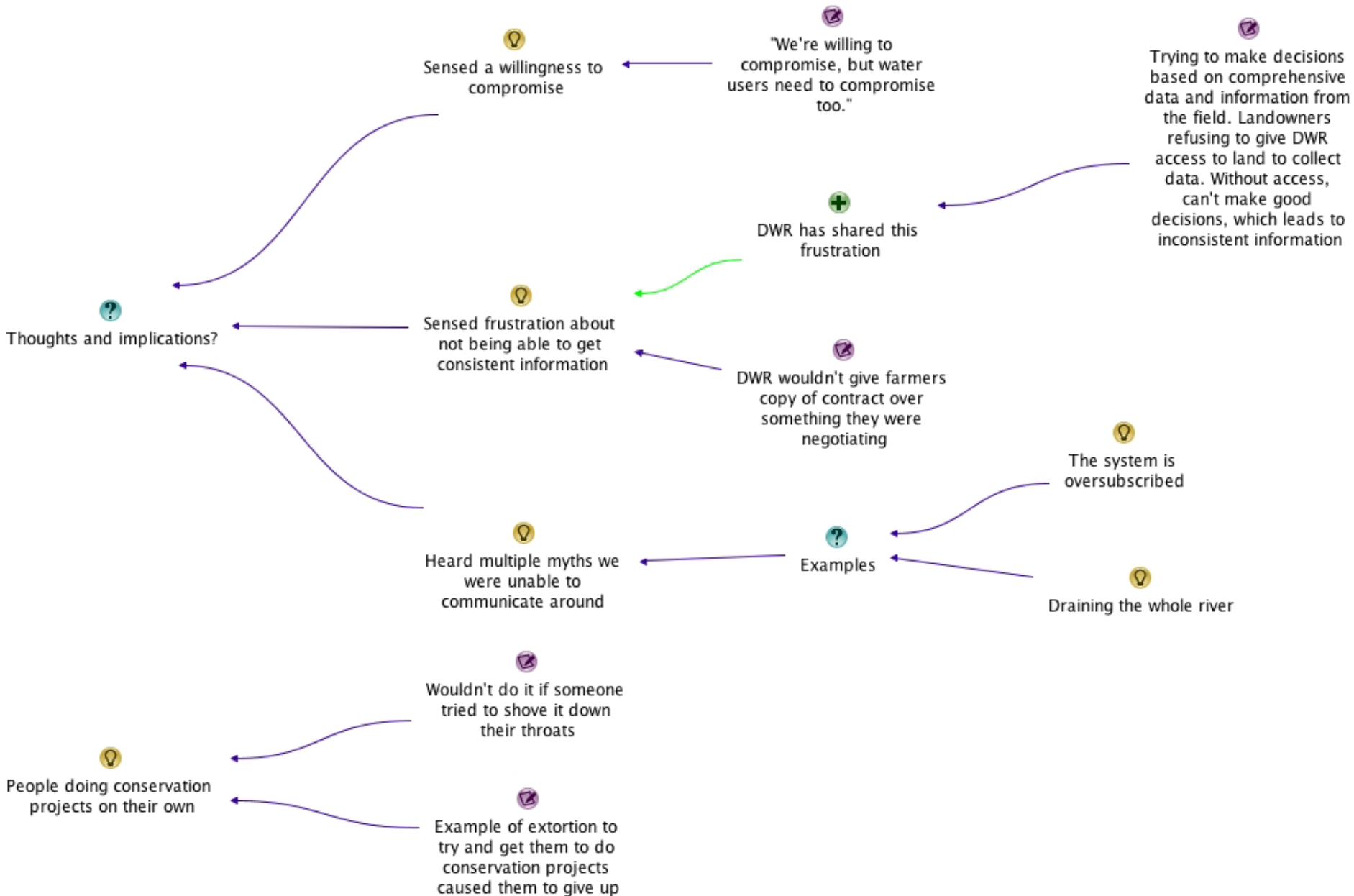
💡  
Lot of pride in ability  
to do what they do and  
compete in world market  
for 6-7 generations

💡  
Uncertainty fills them  
with great anxiety

💡  
They are right next to  
the intake. Will have a  
direct impact in  
perpetuity on their life

# Greene & Hemly site visit

*What did you learn?*



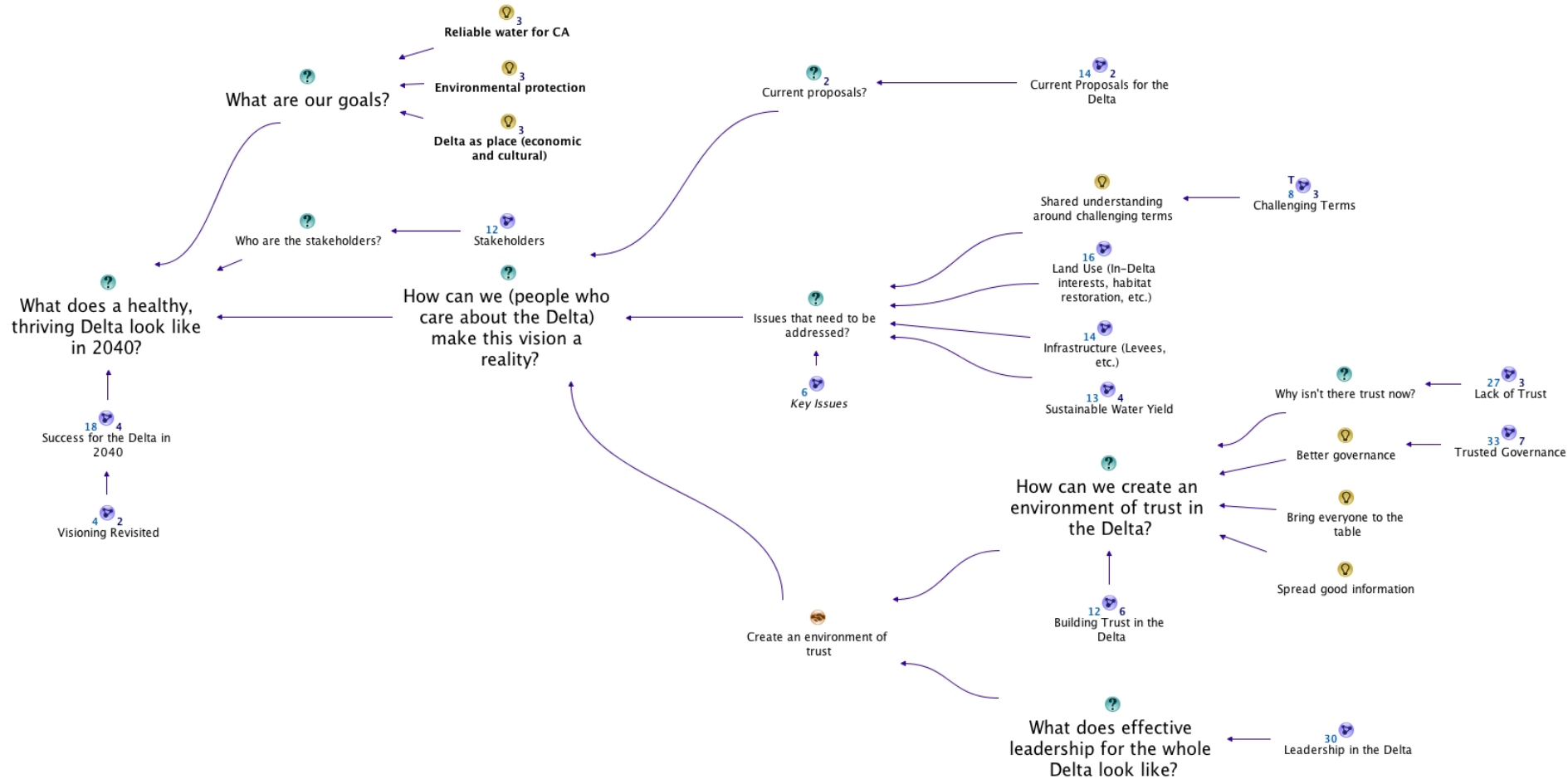




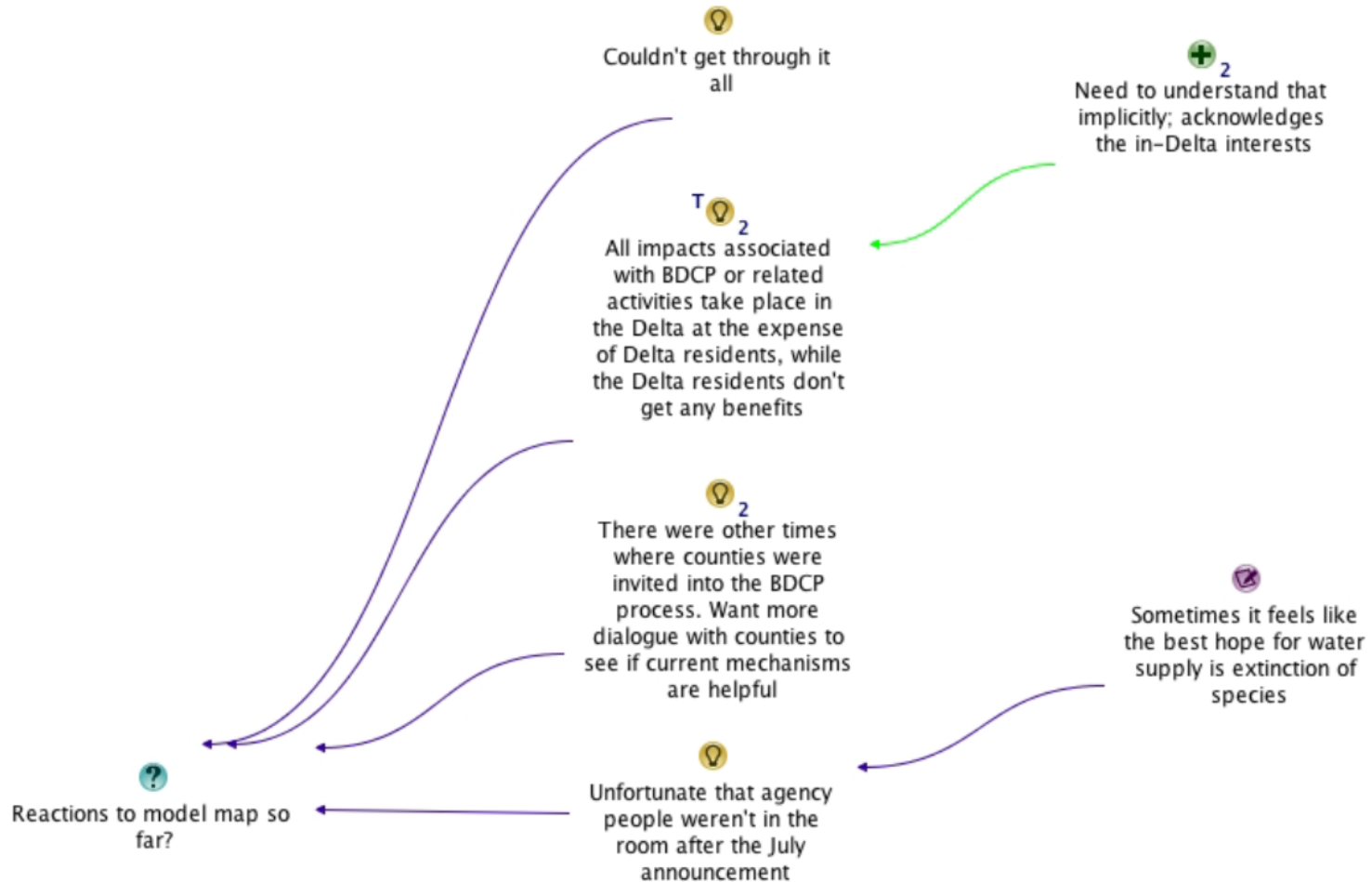
# Exploring Our Maps So Far



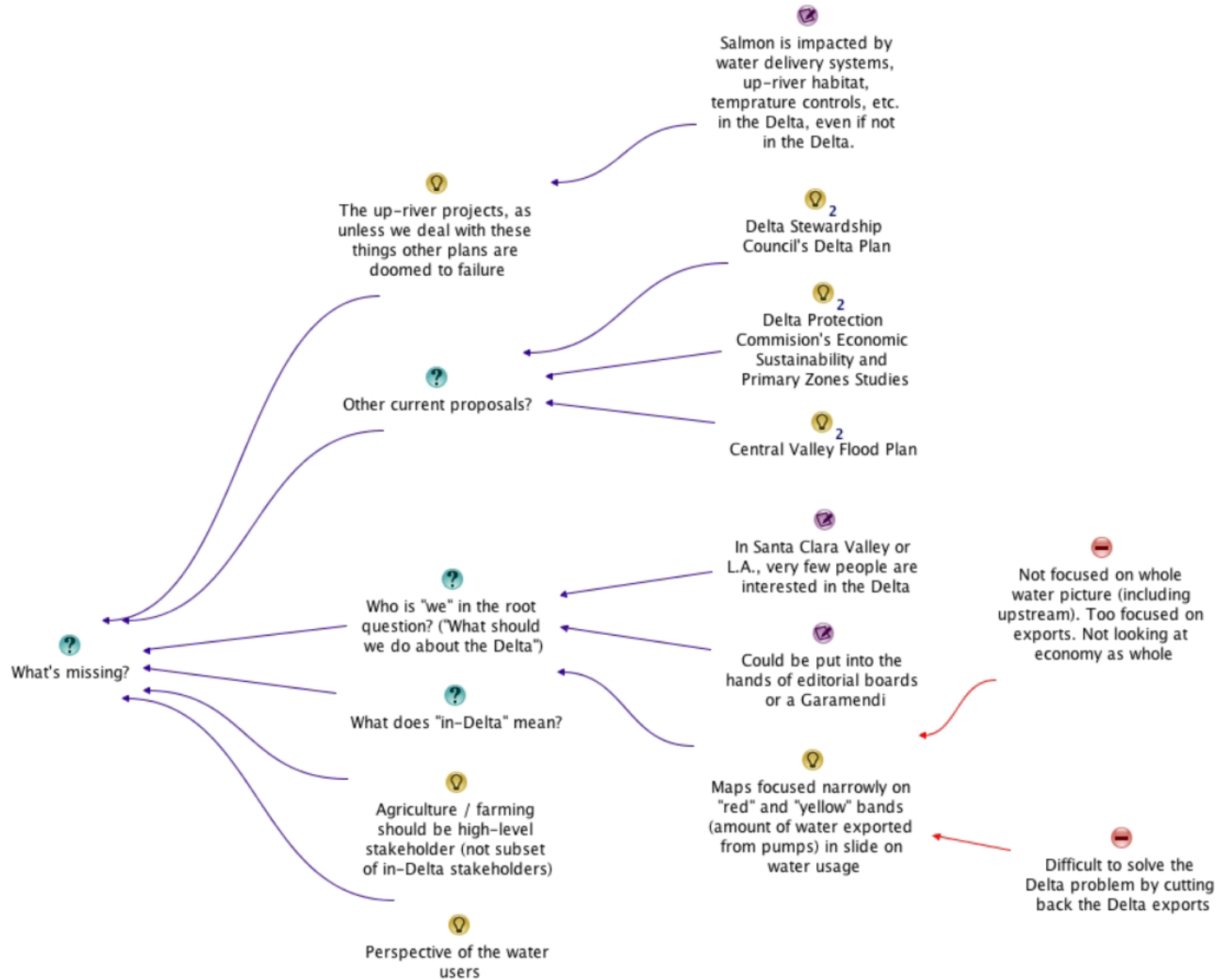
# What should we do about the Delta?



# Reactions to the maps so far



# What's missing?

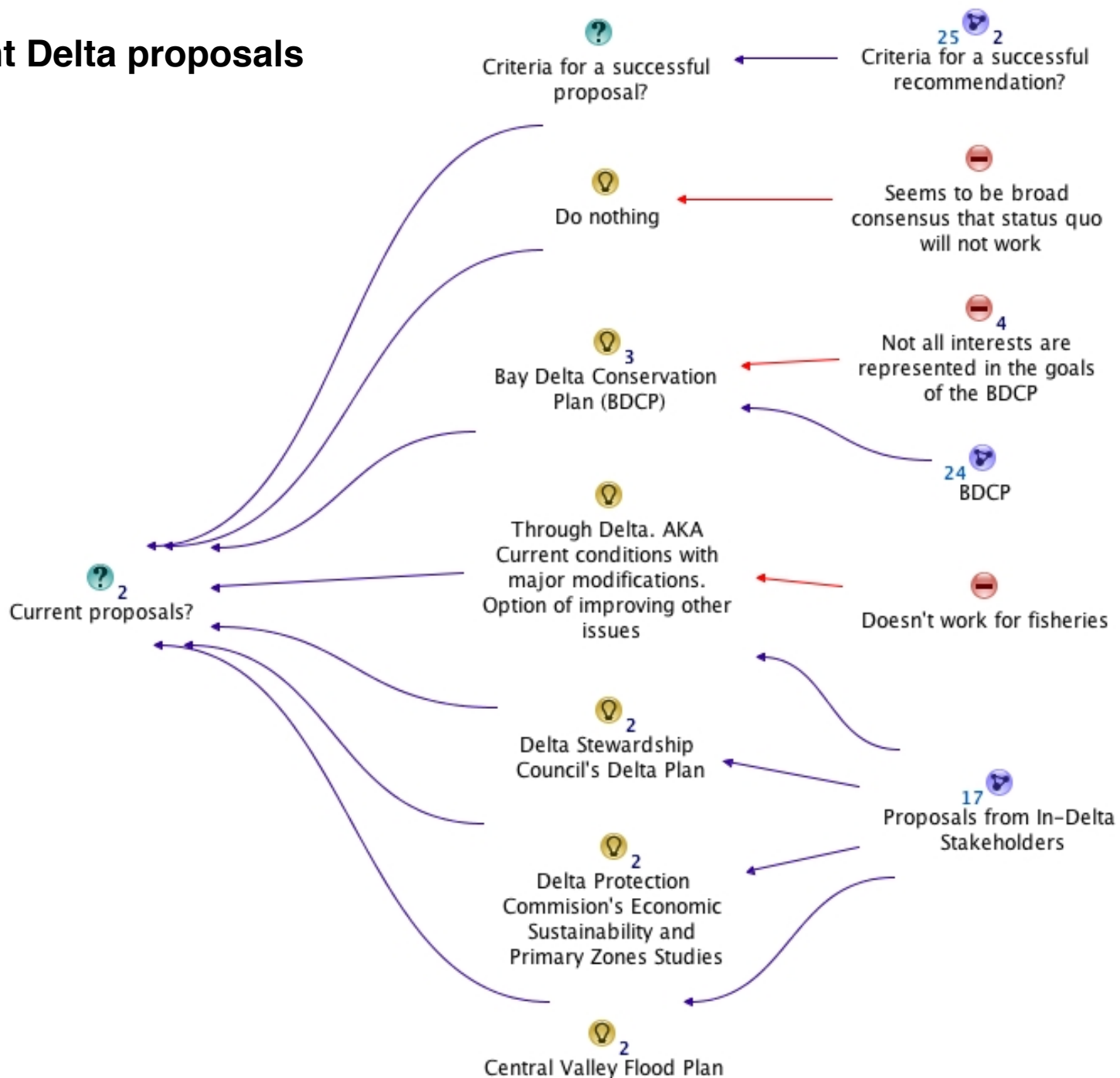




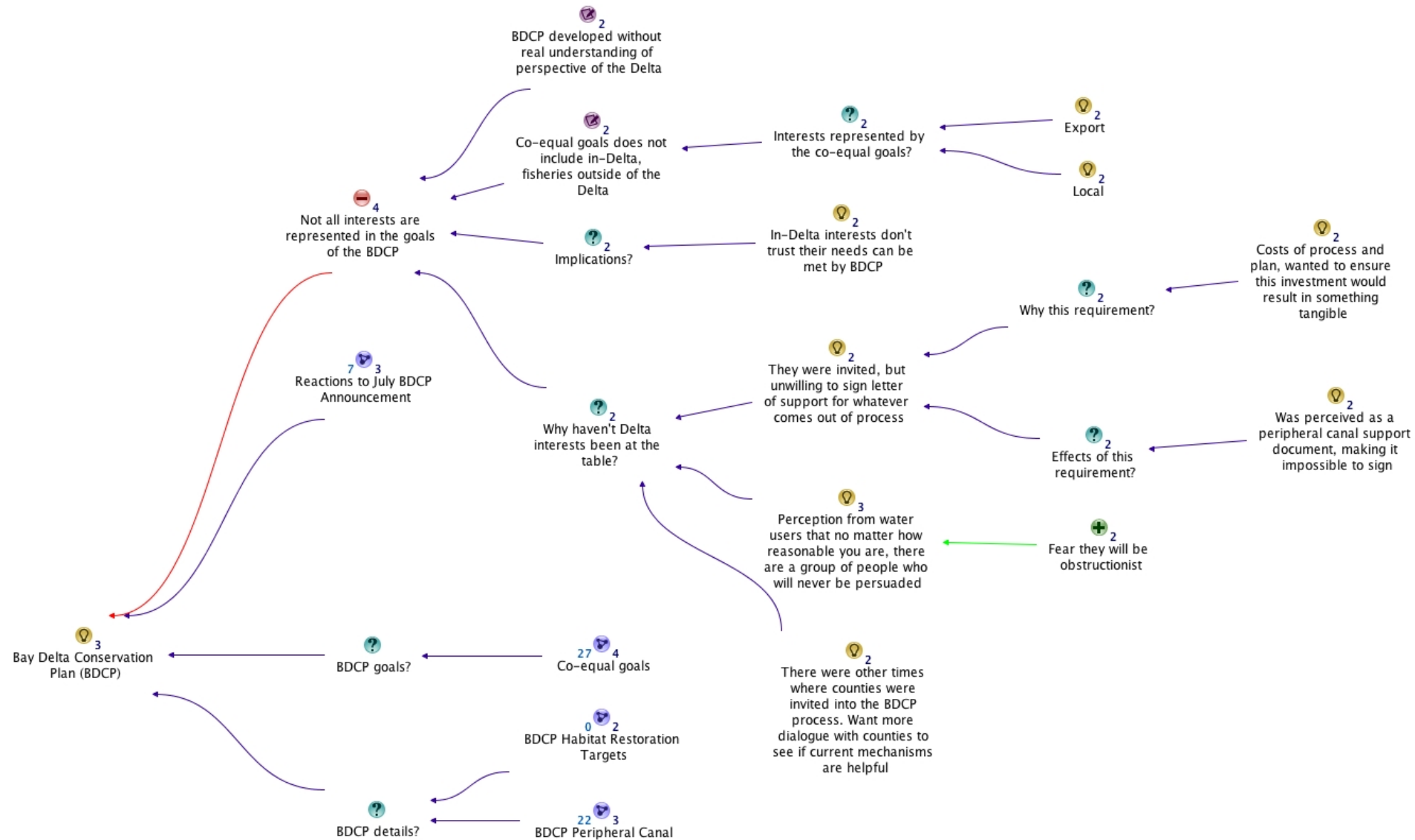


# Current Proposals for the Delta

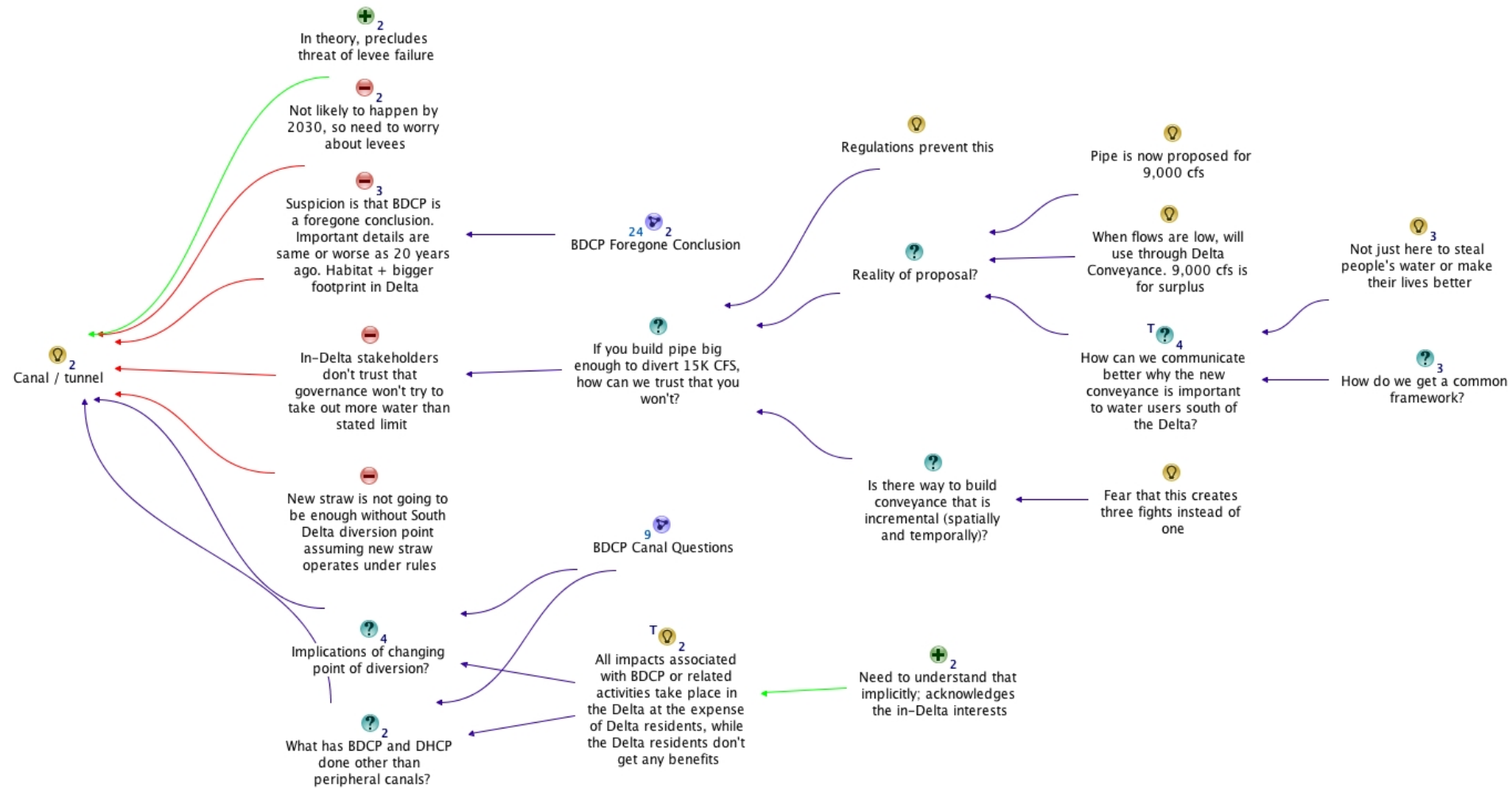
# Current Delta proposals



# BDCP

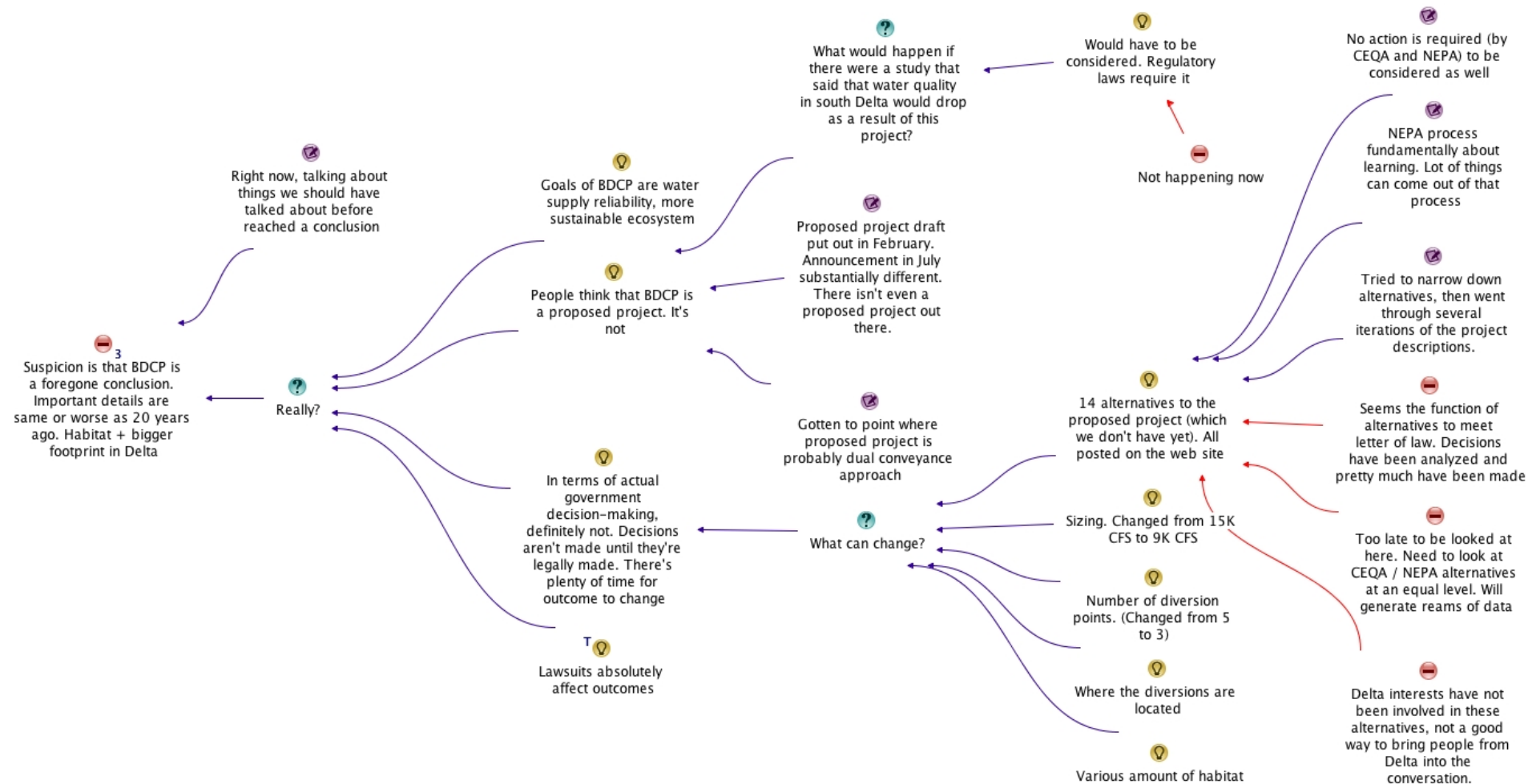


# BDCP peripheral canal





# BDCP foregone conclusion?



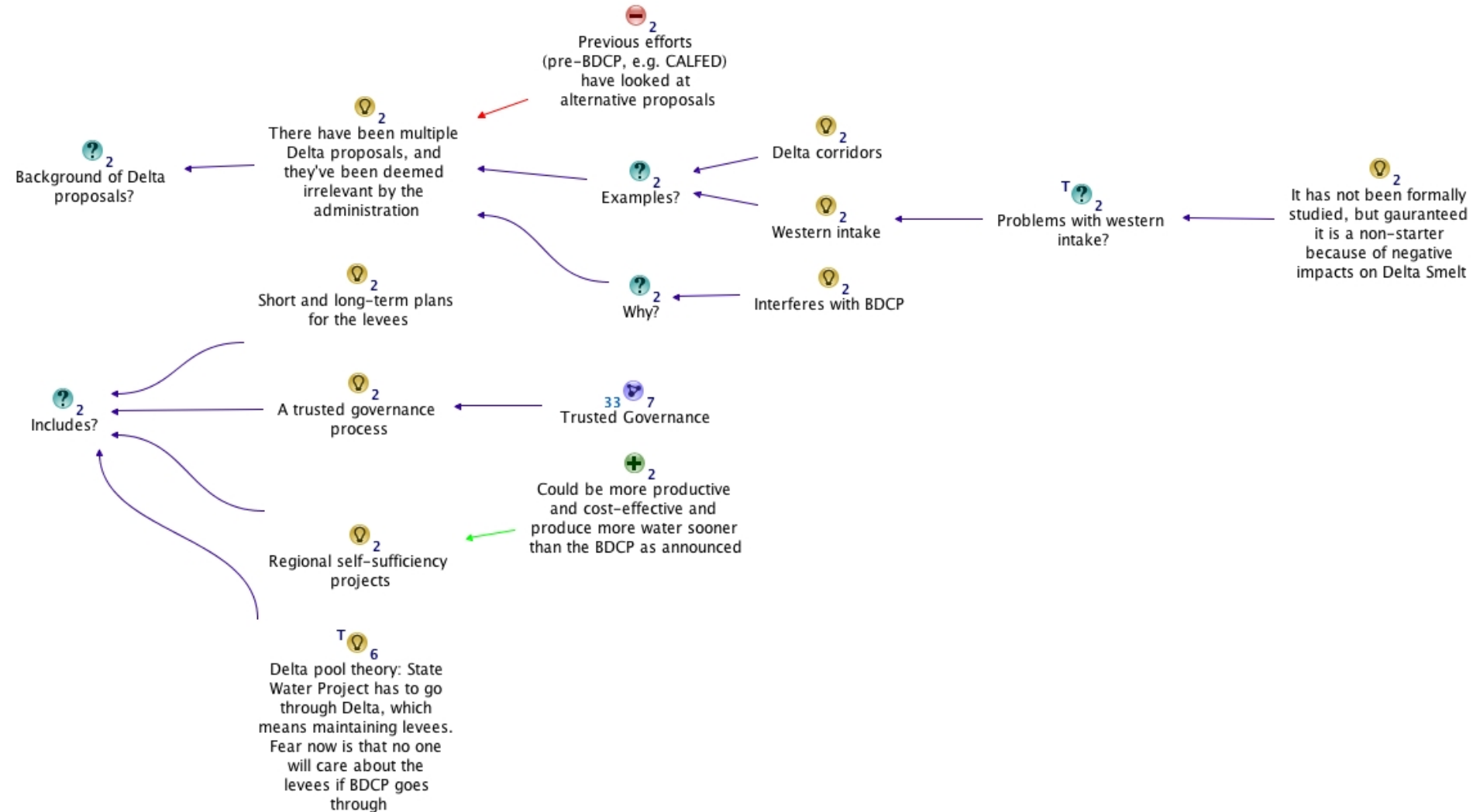
# Questions about BDCP canal?



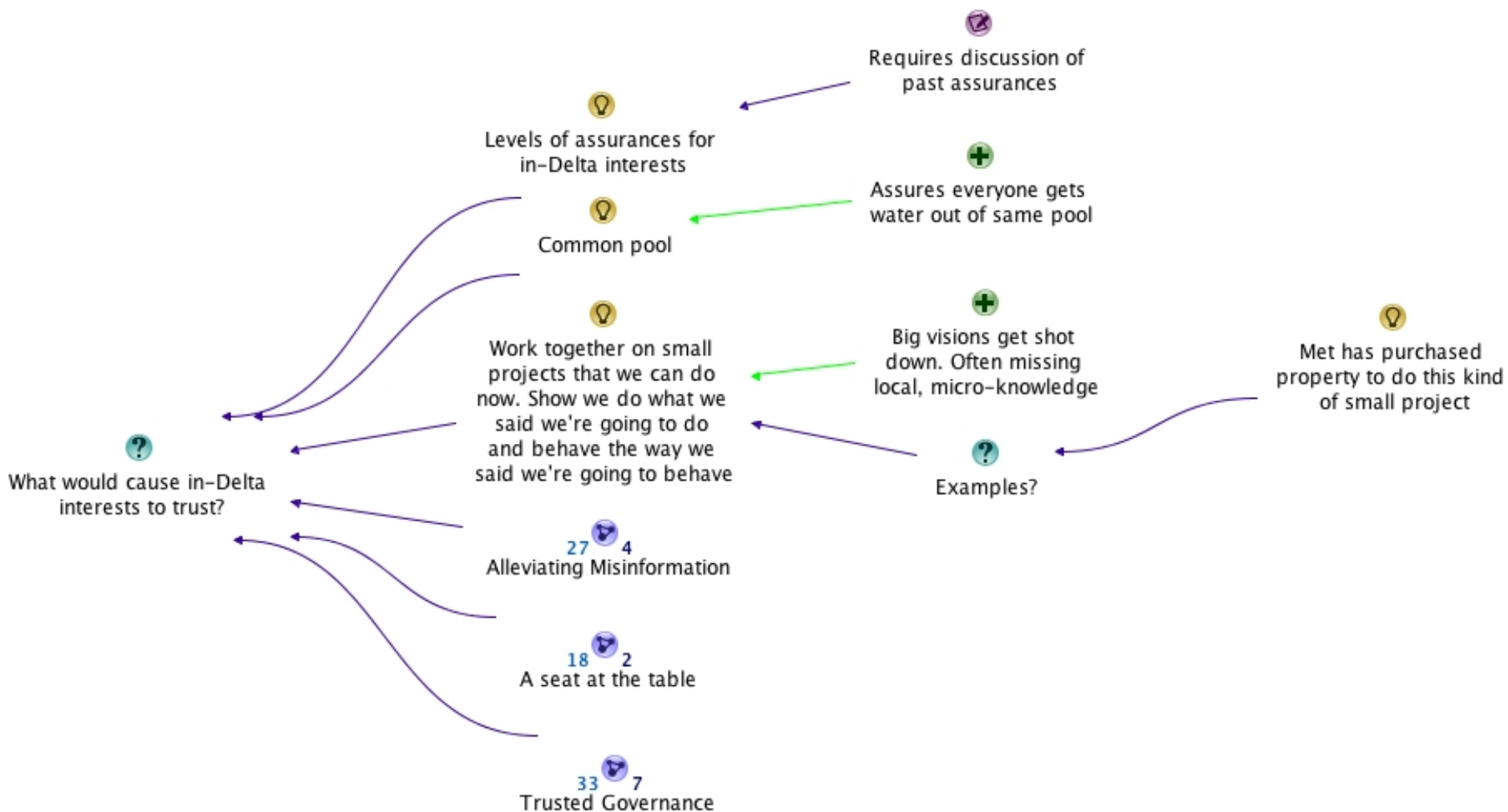
# The In-Delta Perspective



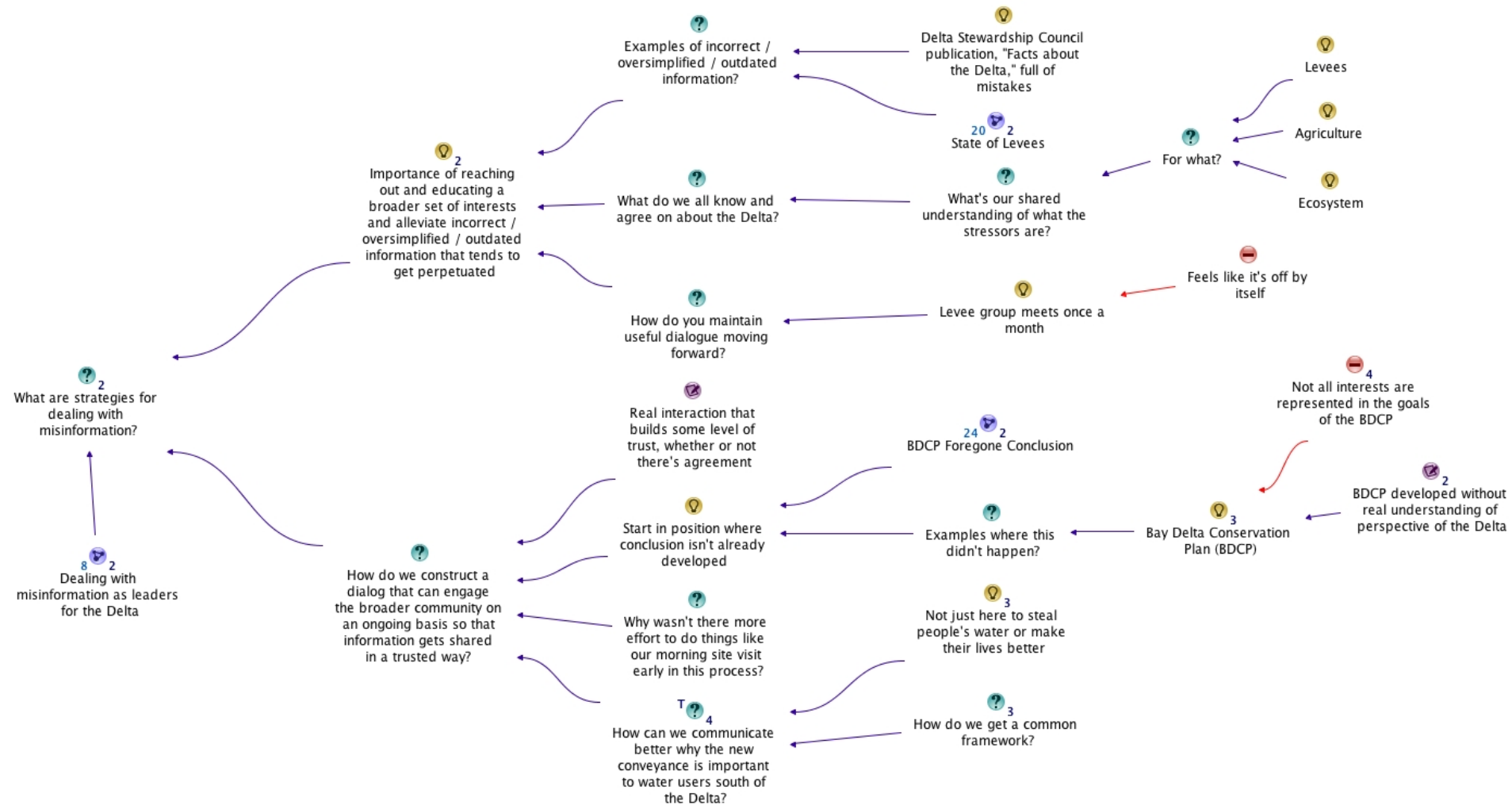
# Proposals from in-Delta stakeholders



# Building trust in the Delta

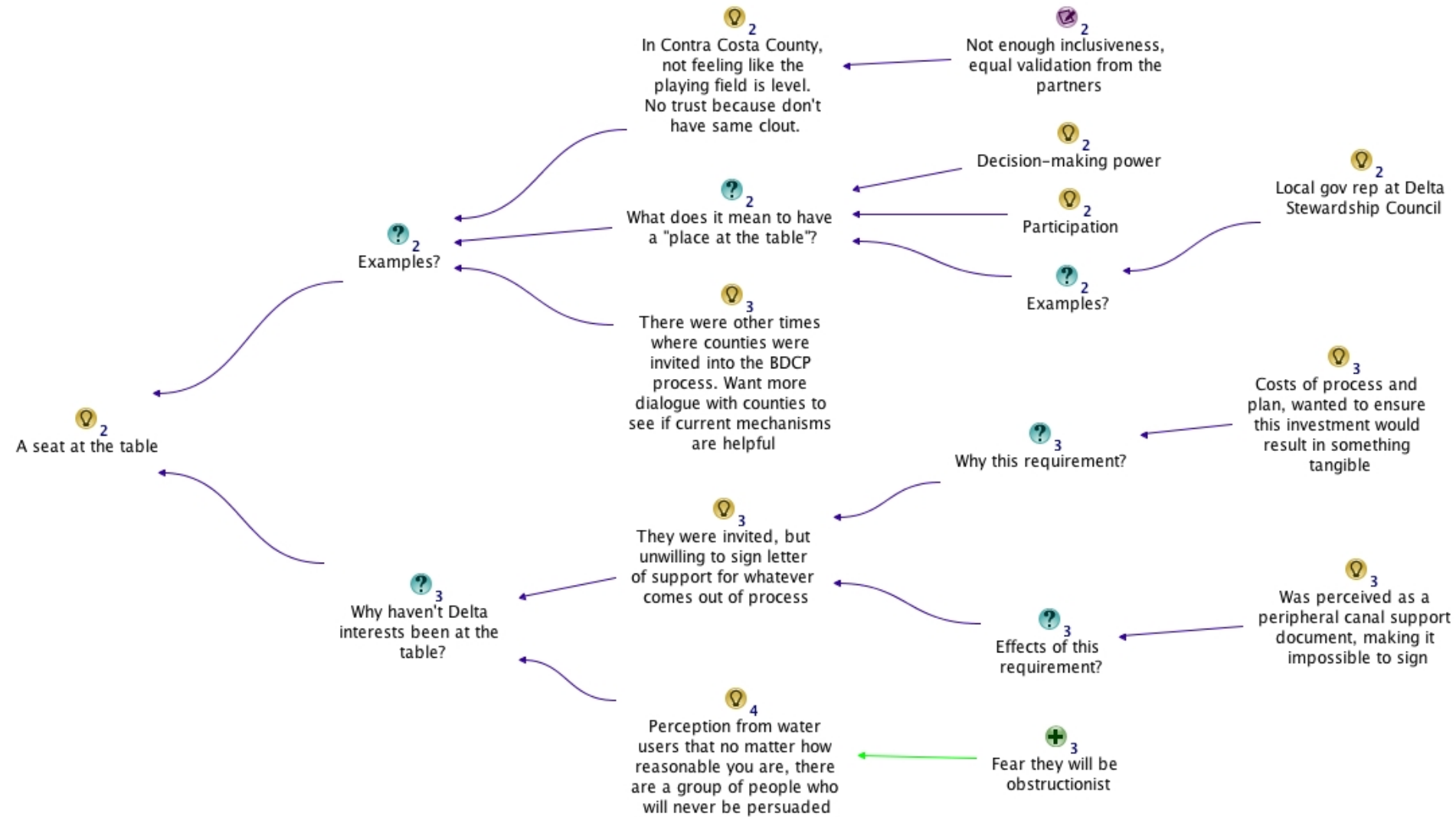


# Alleviating misinformation

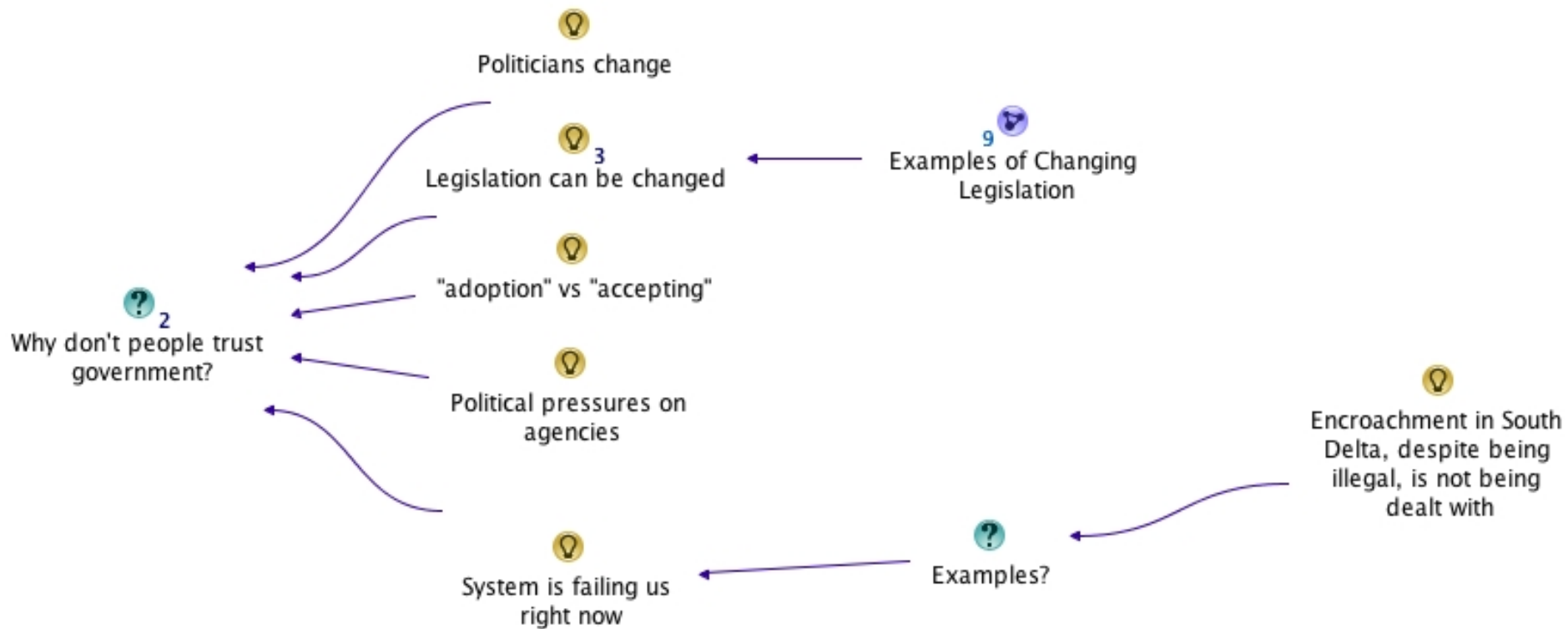




# A seat at the table



# Why don't people trust government?

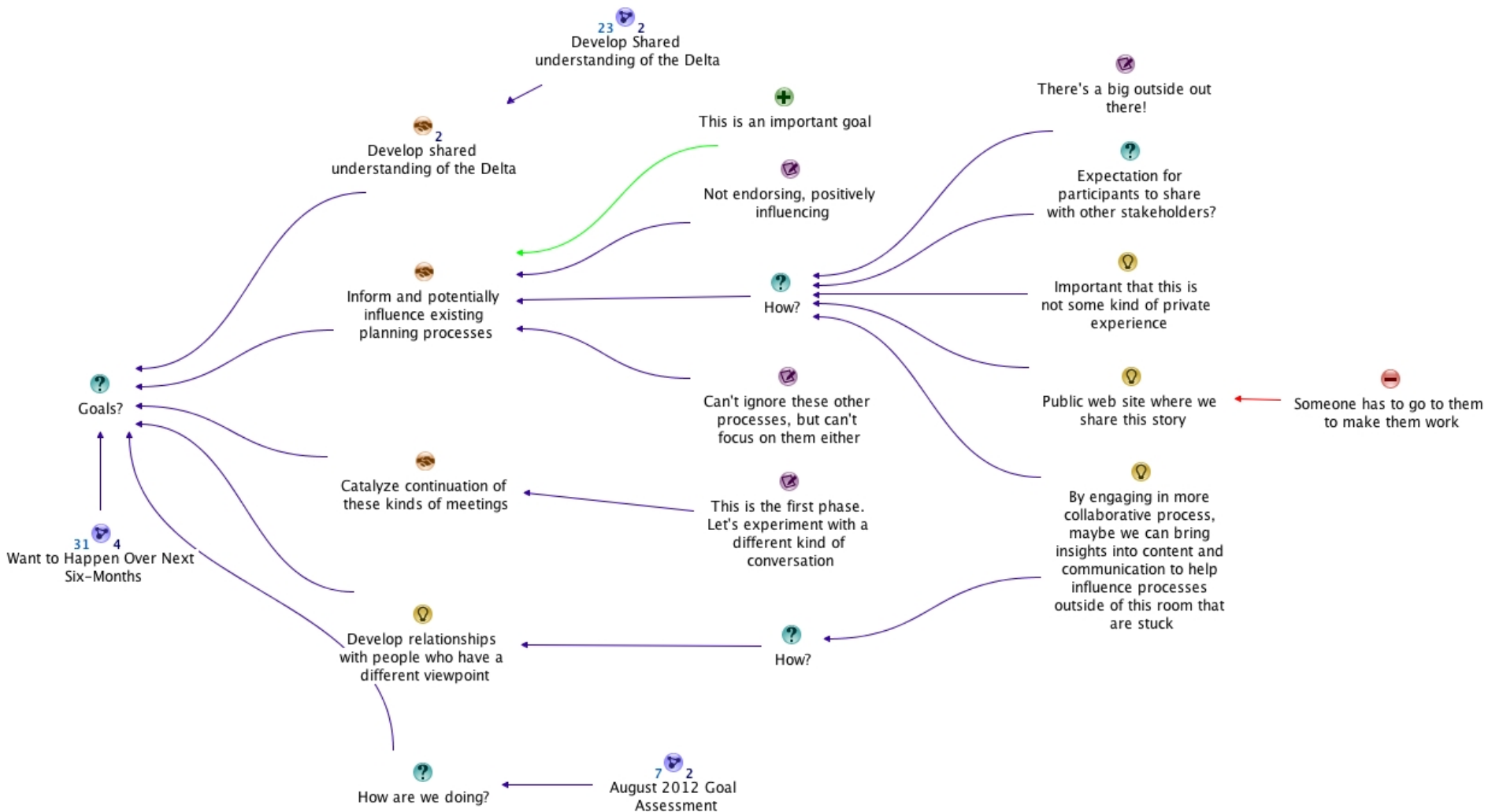




# Goals Assessment and Next Steps



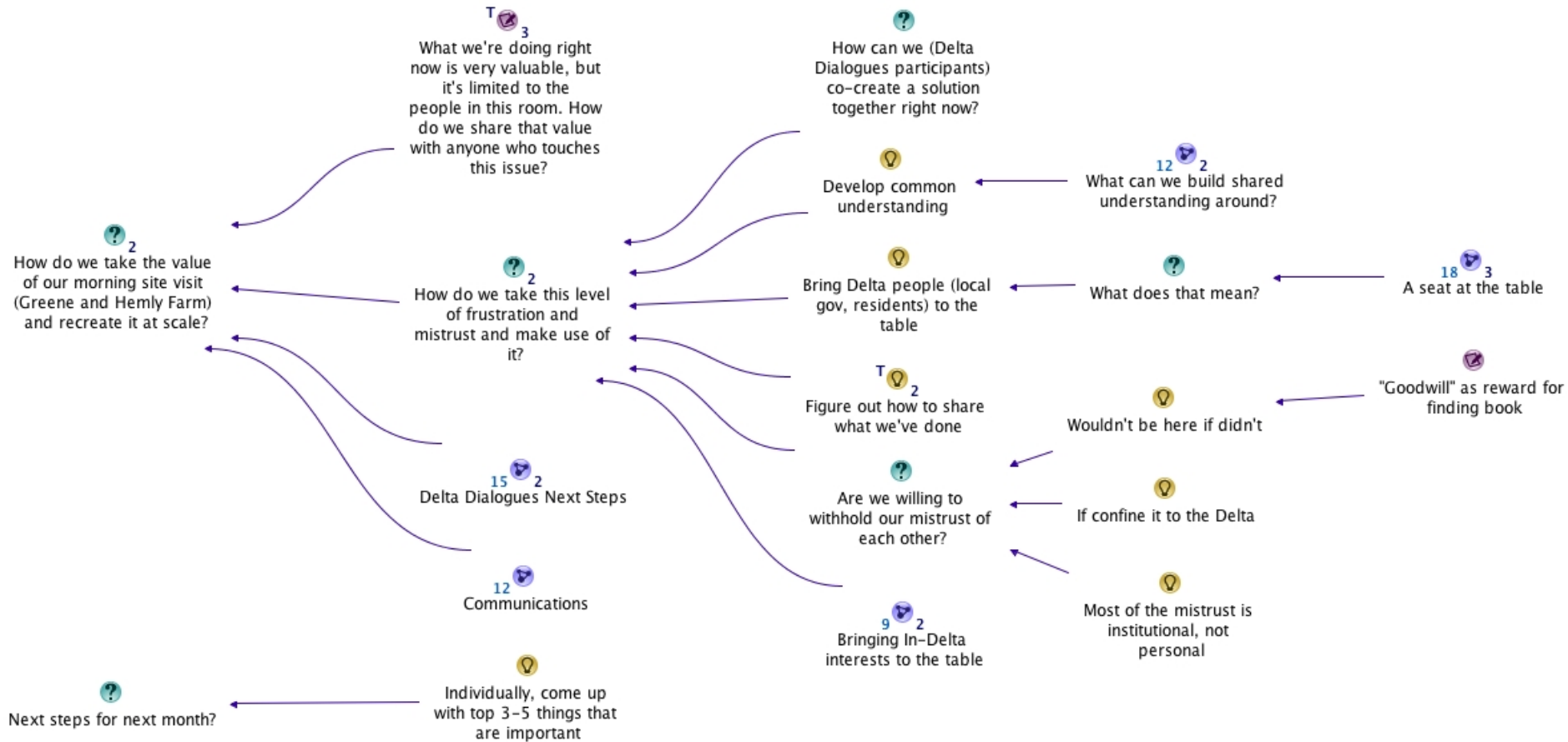
# Delta Dialogues Phase 1 goals?



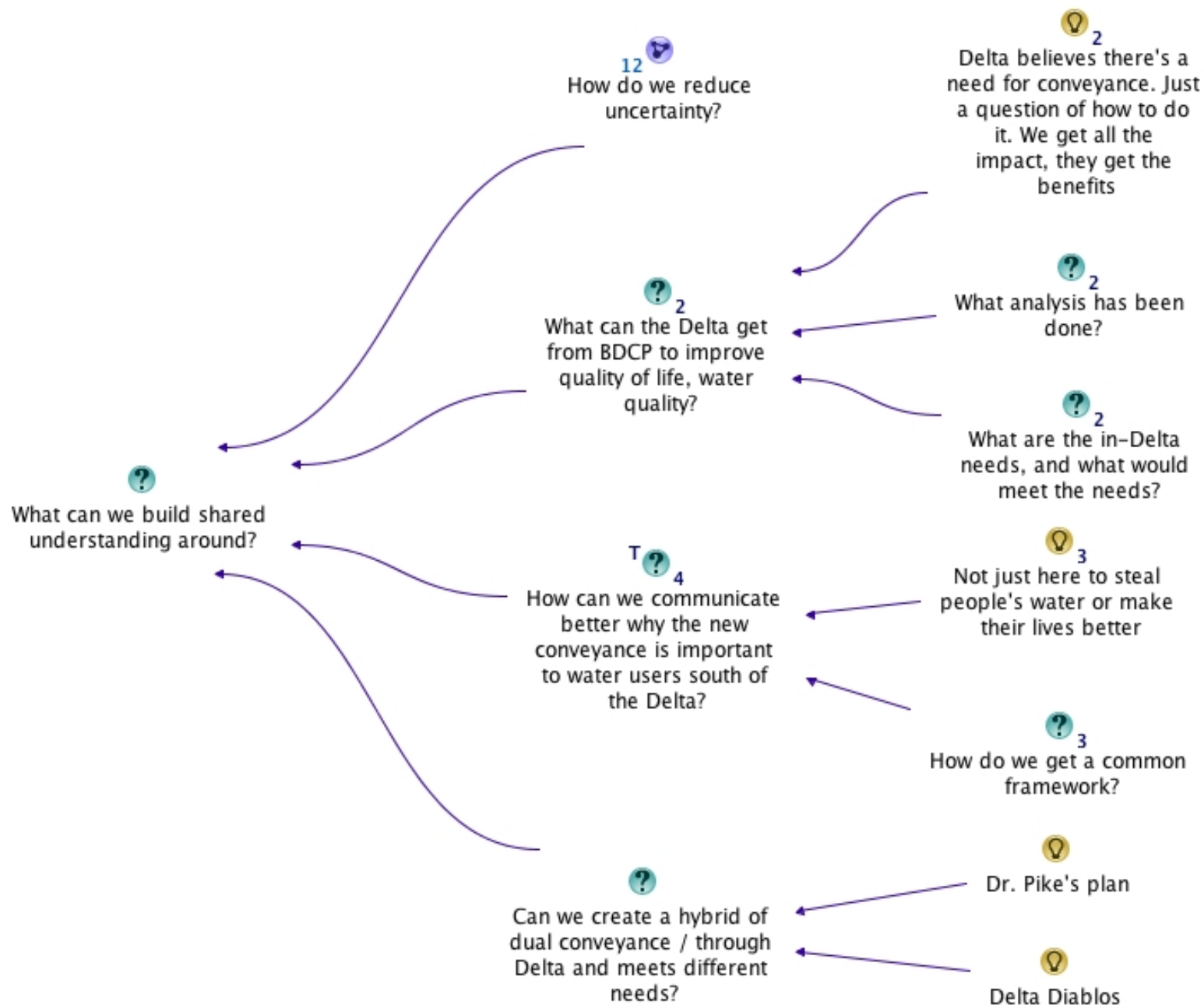
# August 2012 goals assessment



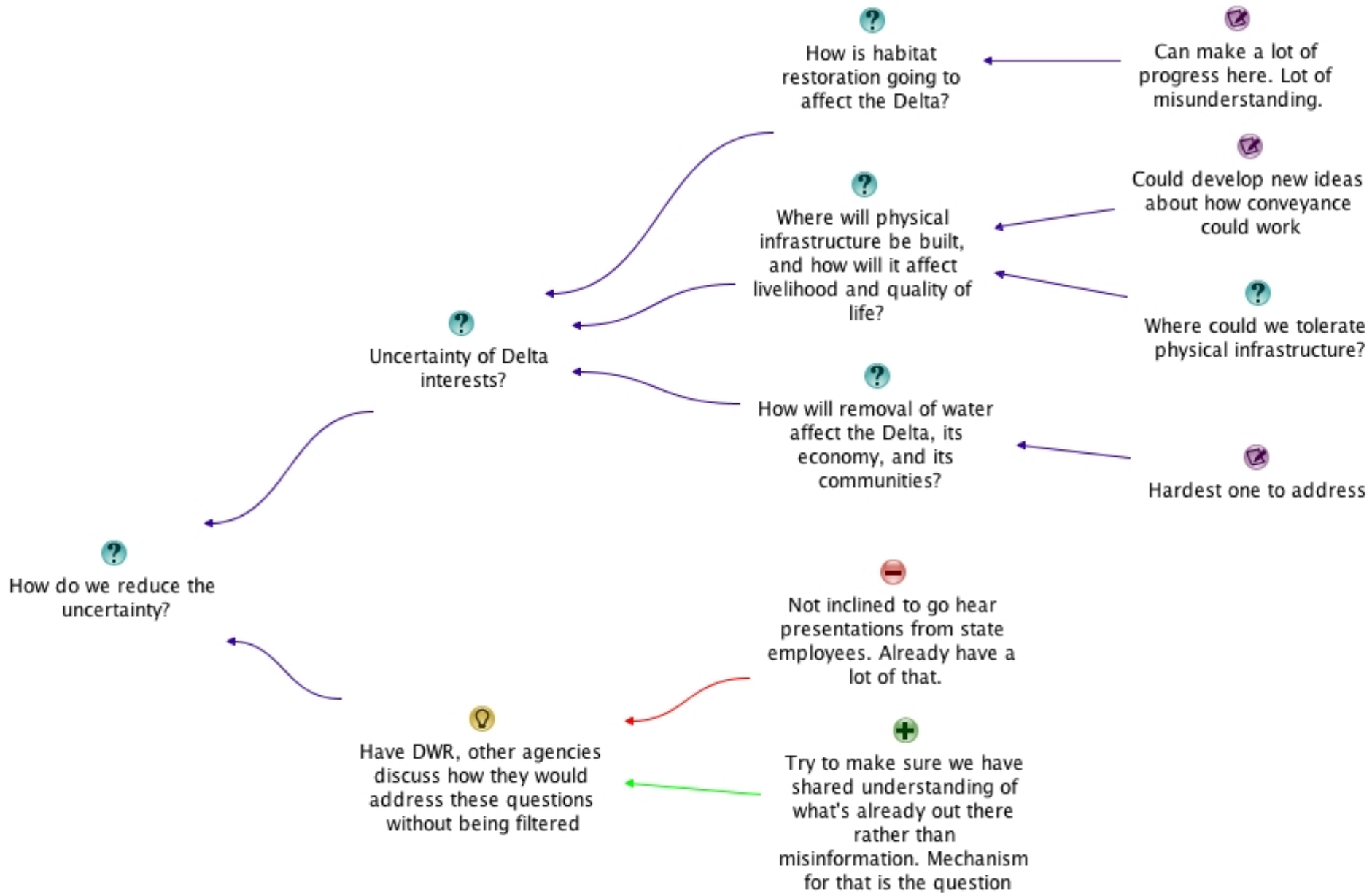
# What's next?



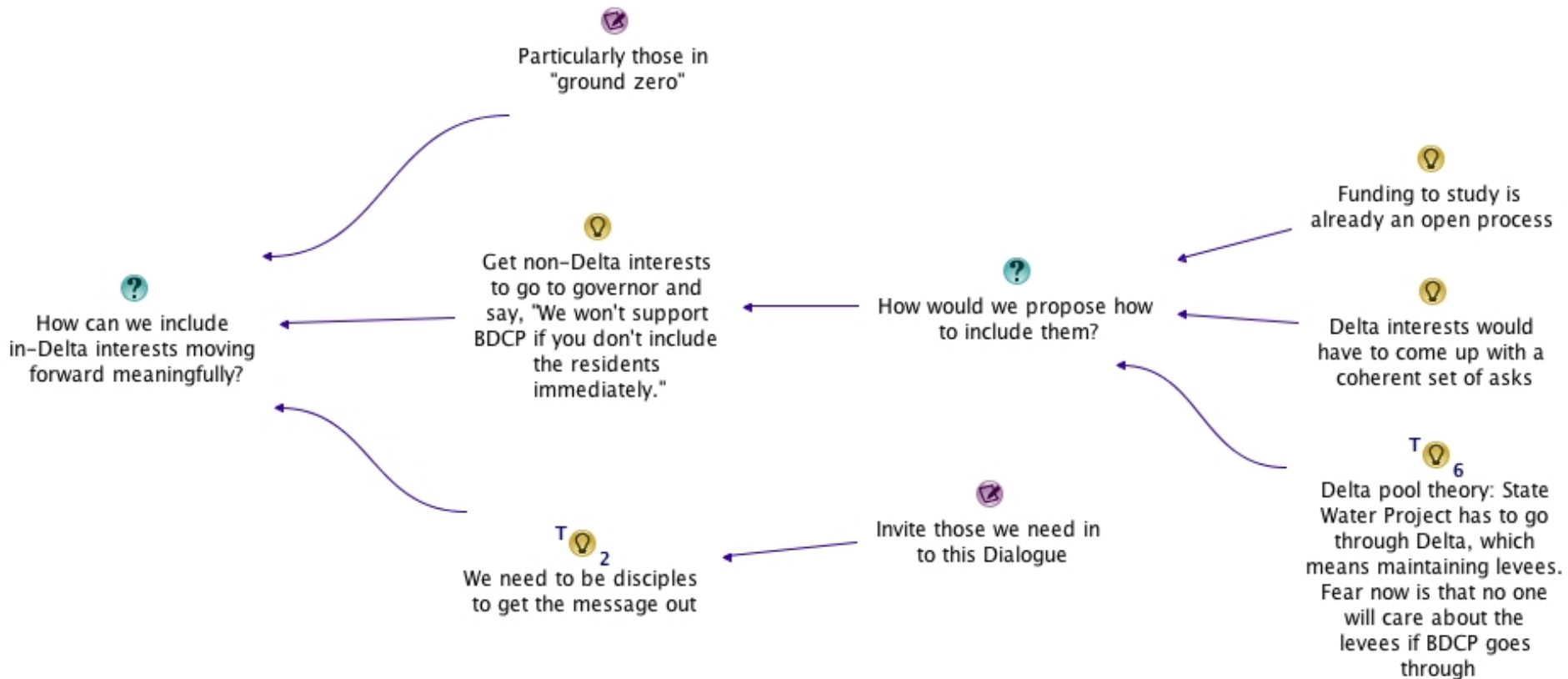
# What can we build shared understanding around?



# How do we reduce uncertainty?

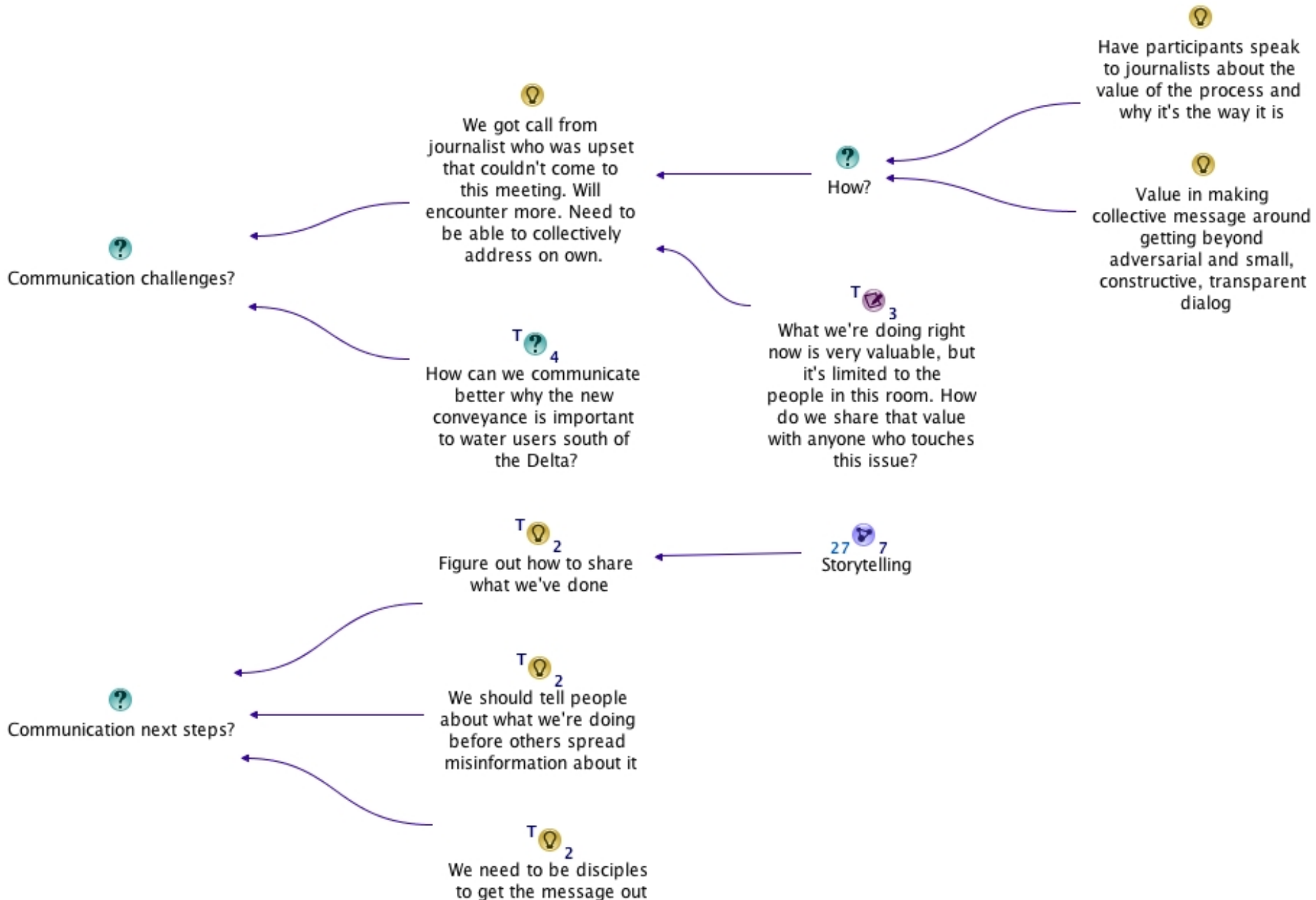


# How can we bring in-Delta interests to the table?





# Communications?





# Check-outs



Tired



One of greatest values of this process: We carry our interactions here subconsciously in every other interactions.

That's incredibly valuable. The rest of the stuff we're talking about it really hard to do, maybe impossible, but even small progress is beneficial



Tour was great. Lots of work to do.



Good progress today. Yes, tiring, but good discussions. Glad to see the agencies here. Good group here today. Lot of people showed up.



Hopeful



Made progress. Also identified some pretty big barriers. Will need a continuation if we're going to get anywhere.



At times, frustration level gets high in the room. It's better to be in the room.



Really useful field trip. Starting to get traction here. Grateful that the agencies are participating at the highest levels, best people who know the most about BDCP and who have a ridiculous amount on their plates. Hard enough to be a stakeholder. To be an arbitrator is harder



Thrilled that the tour was valuable. Remain engaged and optimistic and hopeful that there is productivity at the end of this process that will balance the locals interest with whatever the BDCP outcome is. Ultimately, it's about the Delta.



Concerned about Delta involvement: Not representing the whole Delta. North Delta not nearly as extreme as the rest of the Delta



Same as this morning: Clinically depressed. Frustrated and this has been good.



Appreciated opportunity to show off what's happening in North Delta. Commitment from families to continue what we're doing to the benefit of the environment as well. Feel more educated about some of the fish agency reasons for doing certain things, advocating for certain things

**From:** Jason Peltier

**Sent:** Friday, September 7, 2012 7:15 AM

**To:** 'Karen Clark'; 'Tony Coelho'; 'Carmela McHenry'; 'Carolyn Jensen'; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Jason Peltier'; 'Joe Findaro'; 'Mike Burns'; 'Susan Ramos'; 'T Birmingham

**Subject:** FW: Remand Stakeholder Engagement Process Meeting Information

**Attachments:** Final RSEP\_Meeting\_Guidelines\_9.7.12.docx; Final RSEP Paper 9.7.12 .docx; List\_Invited Stakeholders and Other Participants with Representative Names 9.7.2012.docx; Final Agenda\_Sept Kickoff Mtg\_9-6-12.docx

FYI

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**From:** Fry, Susan M [mailto:SFry@usbr.gov]

**Sent:** Thursday, September 06, 2012 12:22 PM

**To:** 'bmcdonald@staff-tech.net'; [REDACTED]@ [REDACTED] Idlof, Patricia S (Patti); Allen, Kaylee; 'bobker@bay.org'; 'kallaruth@gmail.com'; Obegi, Doug; [REDACTED]@ [REDACTED] [REDACTED] 'Poole, Kate'; 'zgrader@ifrfish.org'; Andrew Hitchings; David Guy; Greg Gartre

**Cc:** 'Thad Bettner'; 'Leah Orloff'; 'Wendy Chriss'; 'Karen Clark'; Chotkowski, Michael; 'Minaberrigarai, Amelia'; 'Laurie Murray'; 'Poole, Melissa'; 'Phillimore, Bill'; 'Cindy Kao'; 'William Paris III'; Fujitani, Paul E; Kiteck, Elizabeth G

**Subject:** Remand Stakeholder Engagement Process Meeting Information

Hello. Please find attached the agenda for the RSE process kickoff meeting being held tomorrow, September 7 at 1pm at the Sheraton Grand. Additionally, please find attached the meeting guidelines, a paper describing the RSE process, and the most current list of participants.

Reclamation looks forward to your participation in this important process.

Sincerely, Sue Fry

*Sue Fry*

Bureau of Reclamation  
Mid-Pacific Region  
Area Manager, Bay-Delta Office  
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Sacramento, CA 95814

Office: 916-414-2401

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## **Meeting Guidelines for the Remand Stakeholder Engagement (RSE) Process**

Reclamation has developed the following meeting guidelines to support the broad purpose of the Remand Stakeholder Engagement (RSE) process: providing non-Federal parties a more formal structure in which to engage with Reclamation and each other for the purpose of understanding key issues and perspectives and providing information which will inform Reclamation's decision making. In particular, these guidelines are intended to promote the open exchange of information and increase understanding about perspectives on key issues associated with the remand. *All RSE process representatives are expected to honor these guidelines as a condition of their participation.*

**Respectful interaction.** RSE process participants will interact in ways that consistently demonstrate respect for individuals despite differences in views, values, and interests related to the RSE process. This includes:

- Appropriate language
- Allowing speakers to finish
- No personal attacks
- Sharing available time

**Focused participation.** RSE process participants will focus any presentations, comments, and interactions with others on agenda topics and will honor requests to stay "on track."

**Good faith.** RSE process participants are expected to contribute to the stated goals of increased transparency, information exchange, and understanding. This contribution includes listening before evaluating and taking responsibility for the reliability of information offered for consideration by others.

**Meeting Agendas and Summaries.** Reclamation plans to prepare written summaries of RSE process events involving invited stakeholders, including the RSE process "kickoff," and post these online. Reclamation also plans to post agendas for these events online.

**Openness and Transparency.** Written information provided by invited stakeholders to Reclamation as part of the RSE process will be made available to the public online by Reclamation in order to promote openness and transparency. This includes, but is not limited to, comments on documents and presentations. Electronic versions of all such information must be provided timely to Reclamation in an appropriate format for posting online. Details about formats will be provided.

**Meeting Attendance.** The RSE process depends significantly on consistent attendance by designated representatives. Meetings will begin on time. Because of the benefits of in-person communication, Reclamation does not plan to make a "call in option" a regular feature of RSE process events.

**Cell phone/Smart phone.** Participants will refrain from disruptive cell/smart phone use during meetings. Cell phones and other electronic communications devices will be turned off or set to "silent" mode; important calls or messages will be addressed outside the meeting venue.

**Recording.** No audio or video recording, or the taking of photographs, will be allowed during RSE process events.

**Attribution of Views.** The RSE process is by invitation in order to promote openness, progress and focus. RSE process participants agree that they will not attribute views, positions, or statements to other RSE process participants outside the RSE process, including but not limited to communications with members of the media. This limitation does not extend to discussions about the RSE process within a representative's organization.

# **Remand Stakeholder Engagement Process**

## **Remanded Biological Opinions on the Coordinated, Long-Term Operation of the Central Valley Project and State Water Project**

Bay-Delta Office  
Mid-Pacific Region, Bureau of Reclamation  
September 2012

### **Introduction**

The Bureau of Reclamation began formal consultation in 2008 with the U.S. Fish and Wildlife Service (Service) and the National Marine Fisheries Service (NMFS) on the coordinated, long-term operation of the Central Valley Project (CVP) and the State Water Project (SWP) pursuant to Section 7 of the Endangered Species Act (ESA). The biological opinions (BOs) issued by the Service and NMFS (collectively, the Services) were remanded by the U.S. District Court for the Eastern District of California and both agencies were ordered to issue new BOs. In addition, Reclamation was ordered by the court to comply with the National Environmental Policy Act (NEPA) prior to accepting and implementing the action described in the new BOs to be issued by the Services. Because the BOs will address the operation of the SWP, it is expected that the remand process will support development of a Consistency Determination under the California ESA for the operation of the SWP in coordination with the CVP.

Reclamation has determined that the California Department of Water Resources (DWR) qualifies as an “applicant” within the meaning of Section 7 of the ESA. Accordingly, Reclamation will work in partnership with DWR to successfully complete the remand process. DWR will also be a cooperating agency in the NEPA process.

In addition to working closely with and seeking information from DWR throughout the remand and NEPA processes, Reclamation will also undertake the Remand Stakeholder Engagement (RSE) process described in this paper. DWR, as the applicant, will participate in the RSE process.

The impetus for the RSE process was the discussions held in the fall of 2011 between certain parties in the *Consolidated Salmonid Cases* and *Consolidated Delta Smelt Cases*. These discussions attempted to reach a stipulated agreement regarding a schedule and process for the participation of non-Federal parties in the remand and NEPA processes. While an agreement was not reached, the commitments made by Reclamation during those discussions, which are within its purview, will be voluntarily effected through the RSE process.

Reclamation, Service, and NMFS must meet the deadlines ordered by the court.<sup>1</sup> Accordingly, there will be limits on the time available for the RSE process. Furthermore, final decisions regarding the environmental impact statement (EIS), the content of information to be submitted by Reclamation to supplement its 2008 biological assessment and the additional information which it provided to the Service in 2011 (collectively, the 2008 supplemented BA), the action to be consulted upon, and the acceptance of reasonable and prudent alternatives (RPAs), if any, proposed by the Services in their new BOs are legally committed to Reclamation's discretion and necessarily rest with it.

### **General Approach to the Remand and NEPA Processes**

As required by the court's order, an EIS will be completed by December 2013. The preferred alternative identified in the final EIS will be the action consulted upon in the remand. Given that the court has ordered the Service's new BO to be completed more than two years before the deadline for the NMFS's new BO, the EIS will have to proceed concurrently with the remand of the Service BO.

If the NMFS's final BO, which is not due for more than another two years, calls for an RPA which differs significantly from the preferred alternative selected in the 2013 EIS and the accompanying Record of Decision (ROD), then the 2013 EIS may have to be supplemented or otherwise revised before Reclamation can proceed with the implementation of the action (or RPA) which is the subject of NMFS's final BO.

Reclamation and DWR anticipate providing information to the Services which updates the 2008 supplemented BA. This information may be presented as a supplement to the 2008 supplemented BA, an entirely new BA, or in some other format. A decision in this regard will be made at a later date.

In order to coordinate the remand of the Service BO with the NEPA process, Reclamation will provide updated information to the Service by July 2013. NMFS has stated that to meet the court deadline of October 2014 for a draft of its new BO, Reclamation must provide supplemental information by August 2013, with minimal changes to the action to be consulted upon as compared to the 2008 project description and RPA in the 2009 BO. If more than minimal changes are proposed, then NMFS may require that updated information be provided before August 2013.

The action to be consulted upon in the remand, whether consisting of the RPAs in the remanded BOs or revisions to them, will address all Federally-listed species that could be affected. The action will consist of the coordinated, long-term operation of the CVP and SWP, and structural modifications to project facilities. Collectively, these were referred to as the "project description" in the 2008 supplemented BA. The action may also include measures, such as habitat restoration, to minimize or offset the adverse effects of the coordinated, long-term

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<sup>1</sup> December 2013 for the Service Final BO, Reclamation decision on that BO and any RPA, and completed NEPA review. October 2014 for the NMFS draft BO; and February 2016 for the final BO, Reclamation decision on that BO and any RPA, and EIS, with the ROD due by April 2016.

operation of the CVP and SWP on listed species if Reclamation judges such to be necessary in order to meet the requirements of Section 7 of the ESA.

### **Overview of the RSE Process**

Typically, Section 7 consultations between an “action agency” such as Reclamation and one or both Services involve only the Federal agencies; an applicant if there is one; and one or more non-Federal representatives if the action agency, under its discretion, designates any. However, for the remand, the RSE process will provide non-Federal parties an opportunity to engage with Reclamation and DWR, as well as with each other, for the purpose of understanding key issues and perspectives and providing and evaluating information to inform Reclamation’s decision making.

Reclamation recognizes that there are many entities in addition to DWR which have an interest in the remand process even though they do not qualify as applicants under Section 7. Accordingly, Reclamation will invite water agencies which are representative of the range of CVP and SWP contractors and non-governmental entities which are representative of commercial fishing and environmental organizations interested in the Bay-Delta (collectively, invited stakeholders) to participate in structured, facilitated discussions and exchanges of information regarding certain aspects of the remand and NEPA processes, as detailed below. In light of their interests and responsibilities, Reclamation will also invite the California Department of Fish and Game (DFG), Service, and NMFS (collectively, the resource agencies) to participate in its discussions with invited stakeholders, particularly regarding core scientific issues.

While the RSE process will focus on receiving information and input from the invited stakeholders, Reclamation may also invite input from other interested parties on matters germane to the coordinated, long-term operation of the CVP and SWP. This will be done on an ad hoc basis as time permits.

With regard to invited stakeholders, Reclamation has also designated, or will offer to designate, each invited water agency as a non-Federal representative pursuant to 50 CFR 402.08. This is being done in recognition of “the policy of Congress that Federal agencies shall cooperate with State and local agencies to resolve water resource issues in concert with conservation of endangered species” (sec. 2(c)(2) of the ESA) and their role as governmental entities which have a unique, and contractually defined, relationship with Reclamation and/or DWR. For the remand, Reclamation will be responsible for updating the 2008 supplemented BA.

### **Facilitated Engagement with the Invited Stakeholders**

Reclamation is committed to an RSE process that is objective, balanced, open, understandable, and appropriately transparent, that contributes to the development of required information, and that assists in informing Reclamation’s decision making and, potentially, that of the resource agencies. Through structured, professionally facilitated processes, all invited stakeholders will be afforded the opportunity to provide input to, and to engage with, Reclamation and DWR, as will the resource agencies if they choose to participate in the RSE process. This will be done

through requests for information from the invited stakeholders and through discussions and exchanges with Reclamation and DWR about the information provided to it and about the conduct and status of the remand and NEPA processes.

The invited stakeholders will not constitute a Federal advisory committee tasked with providing advice to Reclamation. Rather, the invited stakeholders will provide individual input to Reclamation and DWR. Reclamation will consider points of agreement as well as disagreement among invited stakeholders, but will not seek a consensus.

Furthermore, the RSE process is not intended to be a single “meeting table” or discussion forum, but rather a flexible process that uses a combination of formats. Thus, Reclamation may meet with DWR and invited stakeholders individually, in different combinations, and collectively, and will invite the resource agencies to participate as appropriate. Meetings likely will be a combination of face-to-face gatherings, web-based events, and conference calls. They will be conducted in formats most conducive to the purpose to be served (e.g., general discussion meetings, technical workshops, panel presentations, information only meetings, etc.) and in compliance with all applicable Federal and state laws regarding open meetings. All meetings will be subject to guidelines. All RSE process representatives will be expected to honor these guidelines as a condition of their participation.

The RSE process will engage invited stakeholders at both the management and technical levels. Some interactions will be heavily oriented to information and data exchange and scientific issues and will, therefore, involve an invited stakeholder’s technical staff and consultants. Other interactions will be focused on parties’ key interests and questions regarding the conduct of the remand and NEPA processes and will, therefore, involve management-level participation.

Throughout the RSE process, Reclamation will hold regularly scheduled meetings with management-level representatives of the invited stakeholders (singly, in various combinations, or collectively) to discuss the conduct and progress of the remand and NEPA processes and to address major issues. Meetings with technical staff and consultants will be scheduled on an ad hoc basis to address scientific and technical tasks and issues. The resource agencies will be invited to participate.

Reclamation will keep a running list of meetings which it holds as part of the RSE process with subsets of DWR and the invited stakeholders. Brief summaries of such meetings indicating the participants and their affiliations, the meeting date, and the general topics discussed will be made available to all participants in the RSE process as well as via a link on Reclamation’s public website. Written information (either paper or in electronic format) prepared and provided by Reclamation, or received by Reclamation from DWR, invited stakeholders, and the resource agencies, in the course of the RSE process will also be made available to all participants and via Reclamation’s public website.



### **Invited Stakeholder Input to Reclamation in the Remand Process**

To the extent permitted by the court ordered schedules, the RSE process will afford the invited stakeholders the opportunity to provide input to Reclamation at the following junctures in the remand process, with the resource agencies also being invited to participate as appropriate:

- The invited stakeholders, as well as DWR as the applicant, will be afforded the opportunity to provide new information and analyses to Reclamation, to include new data and scientific studies on the effects of project operations and other factors on the listed species, and on the status of the listed species and of their designated critical habitats. A science review process will be organized and supported by Reclamation for this purpose and for the purpose of gathering input from DWR and the invited stakeholders on a defined set of core scientific issues. The design of this science review process, and the identification of core scientific issues, will be among the first items on which Reclamation will seek input. A separate paper describing this science review process will be developed by Reclamation.
- Before supplemental information (in whatever format) is formally submitted by Reclamation to Service and/or NMFS, Reclamation and DWR will provide the invited stakeholders with the opportunity to review and comment on it.
- Reclamation and DWR will seek input from the invited stakeholders regarding the description of the action to be addressed in the remand process.
- Reclamation and DWR will regularly update the invited stakeholders on the discussions and communications it is having with the Services, including questions or requests for information received by Reclamation from the Services.
- When draft BOs are received from the Services, Reclamation and DWR will provide them to the invited stakeholders for their review and comment, subject to such schedules as the Services may require. Reclamation will consider any comments it receives when formulating its responses to the draft BOs.
- If it appears that the BOs will be jeopardy opinion(s), DWR, as the applicant, and the invited stakeholders will be afforded the opportunity to provide input to Reclamation on the development of a BO's RPA and on suggested alternatives to a proposed RPA. Such input will be considered by Reclamation in formulating its responses to the Service and NMFS.

### **Invited Stakeholder Input to Reclamation in the NEPA Process**

In addition to what is required by the NEPA regulations (i.e., public scoping meetings, a scoping report, and public review of a draft EIS), the RSE process will provide the invited stakeholders the opportunity to provide input to Reclamation at the following junctures in the NEPA process to the extent the court ordered schedules permits, with the resource agencies being invited to participate as appropriate:

- Reclamation has invited DWR, DFG, water agencies (invited stakeholders and otherwise), and other governmental entities, as appropriate, to become cooperating agencies for the EIS.

- The cooperating agencies will be able to provide input during the development of the EIS as provided by the NEPA regulations. In addition, invited stakeholders who are not cooperating agencies will, as part of the RSE process, be afforded the opportunity to provide input. Consistent with the requirements and limitations of the NEPA regulations, input from invited stakeholders (both those who are cooperating agencies and those who are not) will be sought with regard to the development of alternatives, the development of information on the affected environment, and the analysis of the impacts of the proposed action, the no action alternative, and other alternatives.
- As provided by the NEPA regulations, the cooperating agencies will be allowed to review and comment on the administrative draft of the EIS. In addition, invited stakeholders who are not cooperating agencies will, as part of the RSE process, be afforded the opportunity to review and comment on the administrative draft EIS.
- In addition to providing the draft EIS for public review and holding public meetings to take comment on it, Reclamation will meet with the invited stakeholders to discuss their comments if requested to do so and if time permits.

### **Reclamation's Management of the Remand, NEPA, and RSE Processes**

The Mid-Pacific Region's Bay-Delta Office has the lead responsibility for the remand and NEPA processes, and for the RSE process. This office will be assisted by other offices in the Mid-Pacific Region. In addition, Reclamation has already procured, and/or will be procuring, the services of consulting firms to assist in the preparation of the EIS and of the supplemental information for the remands.

As it committed it would do, Reclamation has retained Bill McDonald (Staff Tech, Inc.), the recently retired Regional Director of Reclamation's Pacific Northwest Region, who is experienced in managing complex NEPA processes and Section 7 ESA consultations. He will assist Reclamation with the integration of the remand and NEPA processes and with the RSE process, to include interfacing regularly with DWR, the invited stakeholders, and the resource agencies.

Reclamation has also obtained an experienced professional facilitator, J. Michael Harty (Kearns & West), to assist with RSE process design and implementation. His team's responsibilities will include developing meeting or discussion formats and ground rules for participation, facilitating meetings and workshops, promoting constructive communication and the sharing of information, and tracking action items that result from meetings, workshops, or discussions.

Messrs. Harty and McDonald will work together closely in effecting the RSE process under the direction of the Bay-Delta Office.

## Remand Stakeholder Engagement Process

### Applicant and Invited Stakeholders including designated Non-Federal Representatives and Environmental Interests, Fishing Interests, and Other Participants

As of September 7, 2012

Entity/Agency	Representative to Date
<b>Invited Stakeholders</b>	
Coalition for a Sustainable Delta	Paul Weiland
Contra Costa Water District	Greg Gartrell
Glenn-Colusa Irrigation District	Andy Hitchings
Kern County Water Agency	Jim Beck, Curtis Creel
Metropolitan Water District	Roger Patterson, Becky Sheehan
Natural Resources Defense Council	Kate Poole, Doug Obegi
Northern California Water Association Reclamation District 108 Sutter Mutual Water Company	David Guy Lewis Bair Max Sakato
Pacific Coast Federation of Fisherman's Association	Zeke Grader
San Juan Water District (representing all Am River Division Contractors)	Shauna Lorange
San Luis & Delta-Mendota Water Authority	Dan Nelson, Ara Azhderian
Santa Clara Valley Water District	Joan Maher
Stanislaus River Plaintiffs Oakdale Irrigation District South San Joaquin Irrigation District Stockton East Water District	Karna Harrigfeld, Tim O'Laughlin
State Water Contractors	Terry Erlewine
Tehama Colusa Canal Authority	Jeff Sutton
The Bay Institute	Gary Bobker
Water4Fish	Dick Pool
Westlands Water District	Tom Birmingham, Jason Peltier, Sheila Green
<b>ESA Section 7 Applicant</b>	
DWR	Mark Cowin, Dale HF, Kathy Kelly, Cathy Crothers
<b>State/Federal Resource Agencies</b>	
DFG	Carl Wilcox, Scott Cantrell, Chad Dibble
FWS	Ren Lohofener, Dan Castleberry, Mike Chotkowski
NMFS	Rod Mcinnis, Will Stelle, Maria Rea, Garwin Yip
<b>Federal Action Agency</b>	
Reclamation	Don Glaser, Sue Fry

***Remand Stakeholder Engagement (RSE) Process  
Kickoff Meeting for Invited Stakeholders***

***Agenda***

***September 7, 2012; 1-3 p.m. (PDT)  
Sheraton Grand Hotel, 1230 J Street, Sacramento, CA  
Gardenia Room***

***\*Conference line: 866- - Passcode:***

**MEETING PURPOSE:**

Initiate the RSE process with invited stakeholders and other participants

**MEETING OBJECTIVES:**

- Establish a shared understanding of the purposes of the RSE process
- Explain key factors influencing RSE process schedule and approach
- Confirm RSE process guidelines
- Present and discuss next steps in the RSE process

Total time: 2 hours

<b>TIME</b>		<b>AGENDA ITEM</b>
1:00	I.	Welcome
	II.	Introductions and Roles
	III.	Review Agenda, Meeting Objectives and Guidelines
	IV.	Overview of RSE Process Purpose and Key Factors Influencing Approach Including Schedule for Remand and NEPA
	V.	Review Action Items and Next Steps
3:00	VI.	Adjourn

**\*Note:** The conference line is primarily intended as a “listen in” option.

**From:** Jason Peltier

**Sent:** Friday, September 7, 2012 7:30 AM

**To:** 'Karen Clark'; 'Alison MacLeod'; 'Carmela McHenry'; 'Carolyn Jensen'; 'Catherine Karen'; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Joe Findaro'; 'Mike Burns'; 'Susan Ramos'; 'Tony Coelho'; T Birmingham

**Subject:** Smelt hearing...FYI

## Delta smelt appeal hearing next week

Posted on [September 6, 2012](#) by [Damien M. Schiff](#)

On Monday morning in Las Vegas, the Ninth Circuit will hear the consolidated appeals of the federal government and its environmentalist supporters challenging Judge Oliver Wanger's decision to overturn the Delta smelt biological opinion. These appeals promise to be precedent-setting, as Judge Wanger's decision was one of the first to recognize that species interests do not always and everywhere trump human interests, and that the government is not exempt from meeting basic principles of scientific and technical expertise in its decisionmaking under the Endangered Species Act.

**From:** Jason Peltier

**Sent:** Sunday, November 4, 2012 8:13 AM

**To:** Tom Birmingham; Joe Findaro; David Bernhardt

**Subject:** Opinion: Romney's victory message - Ken Khachigian - POLITICO.com

<http://www.politico.com/news/stories/1112/83211.html?hp=118>

**From:** Stewart, Marsha L.  
**Sent:** Thursday, November 15, 2012 7:32 AM  
**To:** Karen Clark (kclark@westlandswater.org)  
**Subject:** Meeting next week - David Bernhardt/Tom Birmingham

**Importance:** High

Hi Karen...I'm making David's flight reservations now and needed to know the location of the 10 a.m. meeting in Sacramento on Monday and the location/information of the hotel you were going to recommend. I've looked through recent travel folders for David and alas, cannot find any hotel information.

As it stands now, David will fly into Sacramento Sunday, 11/18/12 and then fly out Tuesday morning, 11/20/12. That will give them plenty of time to talk between their 10 a.m. meeting any time after Tom's lunch appointment if they need it.

Let me know the location of the meeting and the hotel info when you get a chance.

Thank you!

Marsha

Marsha L. Stewart  
Administrative Assistant to David Bernhardt, Will Moschella and Elizabeth Gore  
Brownstein Hyatt Farber Schreck, LLP  
1350 I Street NW, Suite 510  
Washington, DC 20005  
tel (202) 747-0512  
fax: (202) 296-7009

To ensure compliance with requirements imposed by the IRS, we inform you that any federal tax advice contained in this communication (including any attachments) is not intended or written to be used, and cannot be used, for purposes of (i) avoiding penalties under the Internal Revenue Code, or (ii) promoting, marketing or recommending to another party any transaction or tax-related matter addressed herein.

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**From:** Stewart, Marsha L.  
**Sent:** Thursday, November 15, 2012 7:42 AM  
**To:** Karen Clark (kclark@westlandswater.org)  
**Subject:** Found the hotel David likes in Sacramento...

He will be staying at the Embassy Suites Sacramento River, 100 Capitol Mall, Sacramento, CA 95814, 916-326-5000

Wanted you to know so you don't have to send hotel information...

Thanks!

Marsha

Marsha L. Stewart  
Administrative Assistant to David Bernhardt, Will Moschella and Elizabeth Gore  
Brownstein Hyatt Farber Schreck, LLP  
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**From:** Karen Clark  
**Sent:** Thursday, November 15, 2012 4:24 PM  
**To:** 'Stewart, Marsha L.'  
**Subject:** RE: Found the hotel David likes in Sacramento...

Thanks so much, Marsha. I am glad everything worked out. If you need anything else, please let me know.

*~Karen*

Karen Clark  
Executive Assistant to Thomas W. Birmingham  
Westlands Water District  
P.O. Box 6056  
Fresno, CA 93710  
(c) [REDACTED]  
(f) 559.241.6277  
Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

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**From:** Stewart, Marsha L. [mailto:MStewart@BHFS.Com]  
**Sent:** Thursday, November 15, 2012 6:42 AM  
**To:** Karen Clark (kclark@westlandswater.org)  
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Marsha

Marsha L. Stewart  
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**From:** Karen Clark  
**Sent:** Thursday, November 15, 2012 4:25 PM  
**To:** 'Stewart, Marsha L.'  
**Subject:** RE: Meeting next week - David Bernhardt/Tom Birmingham

Hi Marsha,

The meeting will take place in Tom's office located in the law offices of Kronick, Moskovitz, Tiedemann & Girard, 400 Capitol Mall, 27<sup>th</sup> Floor, Sacramento.

Sincerely,

*~Karen*

Karen Clark  
Executive Assistant to Thomas W. Birmingham  
Westlands Water District  
P.O. Box 6056  
Fresno, CA 93710  
(c) [REDACTED]  
(f) 559.241.6277  
Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

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**To:** Karen Clark (kclark@westlandswater.org)  
**Subject:** Meeting next week - David Bernhardt/Tom Birmingham  
**Importance:** High

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Let me know the location of the meeting and the hotel info when you get a chance.

Thank you!

Marsha

Marsha L. Stewart  
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**From:** Jason Peltier  
**Sent:** Thursday, November 15, 2012 7:11 PM  
**To:** Joe Findaro; David Bernhardt  
**Subject:** Lungren loses

## Rep. Lungren loses reelection bid

By Cameron Joseph - 11/15/12 08:26 PM ET

Democrat Ami Bera has defeated Rep. Dan Lungren (R-Calif.) in one of the closest House races of the cycle.

Bera and Lungren finished within a few hundred votes of one another on election night, but Bera's lead has grown in recent days as mail-in and provisional ballots were counted. He leads Lungren by slightly less than 4,000 votes with some ballots still left to be counted.

The Associated Press called the race for Bera late Thursday evening.

The contest was a rematch between the two: Bera narrowly lost to Lungren in 2010, surprising observers with a better-than-expected performance and strong fundraising skills.

This cycle, Democrats made a major target of Lungren, a four-term lawmaker, spending heavily on Bera's behalf and bringing in former President Bill Clinton to campaign for him. Republicans just as strongly supported Lungren.

Their contest featured a lot outside spending with labor unions, super-PACs and the U.S. Chamber of Commerce all heavily involved.

The AP's call leaves five House races undecided: Reps. Ron Barber (D-Ariz.) and Mike McIntyre (D-N.C.) hold narrow leads in their ballot counts; Rep. Allen West (R-Fla.) is disputing his race, where he trails by a few thousand votes; Rep. Brian Bilbray (R-Calif.) narrowly trails Democrat Scott Peters; and Reps. Charles Boustany (R-La.) and Jeff Landry (R-La.) are heading to an early December runoff.

*-- This story was updated at 8:52 p.m.*

**From:** Tom Birmingham  
**Sent:** Monday, November 19, 2012 10:43 AM  
**To:** 'Karen Clark'  
**Subject:** Meeting with Dave Bernhardt

Karen,  
I assume that my meeting today with Dave Bernhardt is at KMTG. Is that correct?  
Tom

**From:** Karen Clark  
**Sent:** Monday, November 19, 2012 10:43 AM  
**To:** 'Tom Birmingham'  
**Subject:** RE: Meeting with Dave Bernhardt

Yes, it is Tom.

*~Karen*

Karen Clark  
Executive Assistant to Thomas W. Birmingham  
Westlands Water District  
P.O. Box 6056  
Fresno, CA 93710  
(c) [REDACTED]  
(f) 559.241.6277  
Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

---

**From:** Tom Birmingham [mailto:[tbirmingham@westlandswater.org](mailto:tbirmingham@westlandswater.org)]  
**Sent:** Monday, November 19, 2012 9:43 AM  
**To:** 'Karen Clark'  
**Subject:** Meeting with Dave Bernhardt

Karen,  
I assume that my meeting today with Dave Bernhardt is at KMTG. Is that correct?  
Tom

**From:** Karen Clark

**Sent:** Tuesday, November 20, 2012 10:56 AM

**To:** Don Peracchi; 'Alison MacLeod'; 'Carmela McHenry'; 'Carolyn Jensen'; Catherine Karen; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Jason Peltier'; 'Joe Findaro'; 'Mike Burns'; 'Susan Ramos'; 'Tony Coelho'

**Subject:** December 17, 8:00 a.m. Meeting

All,

This is to confirm that there will be an in-person PR/Legislation Meeting on December 17 at **8:00 a.m.** (not 9:00 a.m. as previously stated) in Sacramento at KP Communications, 1201 K Street, Suite 800.

If you have any questions, please contact me.

Sincerely,

*~Karen*

Karen Clark

Executive Assistant to Thomas W. Birmingham

Westlands Water District

P.O. Box 6056

Fresno, CA 93710

(c) [REDACTED]

(f) 559.241.6277

Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Carmela McHenry  
**Sent:** Tuesday, November 20, 2012 11:29 AM  
**To:** 'Karen Clark'  
**Subject:** RE: December 17, 8:00 a.m. Meeting

Thanks, K. I've marked our calendars accordingly from 8 AM to noon on December 17<sup>th</sup>. I am glad it all worked out. ☺

FYI – At Ed's request --- I've made the arrangements to serve a continental breakfast (pastries/bagels/OJ/coffee) at 8 AM and lunch (pre-made sandwiches/chips/tri-color pasta salad/sodas/dessert) at 11:30 AM for this meeting.

If the above info doesn't work for Westlands, please let me know and I'll change the arrangements accordingly. Also, if I can be of any assistance on the 17<sup>th</sup>, please don't hesitate to ask.

Happy Thanksgiving to you and yours!

*Carmela McHenry*

(Direct) 916-498-7711

(Fax) 916-448-4923

---

**From:** Karen Clark [mailto:kclark@westlandswater.org]  
**Sent:** Tuesday, November 20, 2012 9:56 AM  
**To:** Don Peracchi; Alison MacLeod; Carmela McHenry; Carolyn Jensen; Catherine Karen; 'David Bernhardt'; Doug Subers; Ed Manning; 'Gayle Holman'; 'Jason Peltier'; 'Joe Findaro'; Michael Burns; 'Susan Ramos'; 'Tony Coelho'  
**Subject:** December 17, 8:00 a.m. Meeting

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If you have any questions, please contact me.

Sincerely,

~Karen

Karen Clark

Executive Assistant to Thomas W. Birmingham

Westlands Water District

P.O. Box 6056

Fresno, CA 93710

(c) [REDACTED]

(f) 559.241.6277

Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)



**From:** Karen Clark  
**Sent:** Tuesday, November 20, 2012 11:52 AM  
**To:** 'Carmela McHenry'  
**Subject:** RE: December 17, 8:00 a.m. Meeting

Thanks, Carmela. This looks great. I just sent another email changing the time back to 9:00 a.m. Whew! Whirlwind!

Have a Happy Thanksgiving. Hope you and yours have a wonderful holiday.

~Karen

Karen Clark  
Executive Assistant to Thomas W. Birmingham  
Westlands Water District  
P.O. Box 6056  
Fresno, CA 93710  
(c) [REDACTED]  
(f) 559.241.6277  
Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

---

**From:** Carmela McHenry [mailto:cmchenry@ka-pow.com]  
**Sent:** Tuesday, November 20, 2012 10:29 AM  
**To:** 'Karen Clark'  
**Subject:** RE: December 17, 8:00 a.m. Meeting

Thanks, K. I've marked our calendars accordingly from 8 AM to noon on December 17<sup>th</sup>. I am glad it all worked out. ☺

FYI – At Ed's request --- I've made the arrangements to serve a continental breakfast (pastries/bagels/OJ/coffee) at 8 AM and lunch (pre-made sandwiches/chips/tri-color pasta salad/sodas/dessert) at 11:30 AM for this meeting.

If the above info doesn't work for Westlands, please let me know and I'll change the arrangements accordingly. Also, if I can be of any assistance on the 17<sup>th</sup>, please don't hesitate to ask.

Happy Thanksgiving to you and yours!

*Carmela McHenry*  
(Direct) 916-498-7711  
(Fax) 916-448-4923

---

**From:** Karen Clark [mailto:kclark@westlandswater.org]  
**Sent:** Tuesday, November 20, 2012 9:56 AM  
**To:** Don Peracchi; Alison MacLeod; Carmela McHenry; Carolyn Jensen; Catherine Karen; 'David Bernhardt'; Doug Subers; Ed Manning; 'Gayle Holman'; 'Jason Peltier'; 'Joe Findaro'; Michael Burns; 'Susan Ramos'; 'Tony Coelho'  
**Subject:** December 17, 8:00 a.m. Meeting

All,

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If you have any questions, please contact me.

Sincerely,

*~Karen*

Karen Clark

Executive Assistant to Thomas W. Birmingham

Westlands Water District

P.O. Box 6056

Fresno, CA 93710

(c) [REDACTED]

(f) 559.241.6277

Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Carmela McHenry  
**Sent:** Tuesday, November 20, 2012 11:55 AM  
**To:** 'Karen Clark'  
**Subject:** RE: December 17, 8:00 a.m. Meeting

Wow...crazy whirlwind indeed! I've updated our calendars to 9 AM and will change the delivery time for breakfast. Thanks, K. Take care.

*Carmela McHenry*

(Direct) 916-498-7711  
(Fax) 916-448-4923

---

**From:** Karen Clark [mailto:kclark@westlandswater.org]  
**Sent:** Tuesday, November 20, 2012 10:52 AM  
**To:** Carmela McHenry  
**Subject:** RE: December 17, 8:00 a.m. Meeting

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Karen Clark  
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(f) 559.241.6277  
Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

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**From:** Carmela McHenry [mailto:cmchenry@ka-pow.com]  
**Sent:** Tuesday, November 20, 2012 10:29 AM  
**To:** 'Karen Clark'  
**Subject:** RE: December 17, 8:00 a.m. Meeting

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(Direct) 916-498-7711  
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**Sent:** Tuesday, November 20, 2012 9:56 AM

**To:** Don Peracchi; Alison MacLeod; Carmela McHenry; Carolyn Jensen; Catherine Karen; 'David Bernhardt'; Doug Subers; Ed Manning; 'Gayle Holman'; 'Jason Peltier'; 'Joe Findaro'; Michael Burns; 'Susan Ramos'; 'Tony Coelho'

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*~Karen*

Karen Clark

Executive Assistant to Thomas W. Birmingham

Westlands Water District

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Fresno, CA 93710

(c) [REDACTED]

(f) 559.241.6277

Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Jason Peltier  
**Sent:** Wednesday, November 28, 2012 2:03 PM  
**To:** T Birmingham; Joe Findaro; David Bernhardt; Tony Coelho  
**Subject:** Garamendi

# Garamendi Appointed to Agriculture Committee During Farm Bill Negotiations

Nov 27, 2012 Issues: [Agriculture](#), [Economy](#)

WASHINGTON, DC – Today, Congressman John Garamendi (D-Fairfield, CA) was recommended to serve as a Member of the House Agriculture Committee. He expects official approval at tomorrow's Democratic Caucus meeting. Garamendi, a lifelong rancher and farmer, will join in bicameral negotiations on the farm bill, which could be voted on by the House in December.

"I didn't enter Congress to twiddle my thumbs and sit quietly in the background. I must be where the needs of my district are and that's in the final negotiations for the five-year farm bill. I want to thank Speaker Boehner and Leader Pelosi for giving me this opportunity to serve where I am needed," said Congressman Garamendi.

"Passing a good farm bill is very important to the family farmers in my district, and the nutrition assistance in the farm bill provides vital help to struggling families throughout California," Garamendi added. "As a farmer and rancher, I know we need to get this done, and I will work around the clock to make sure California specialty crops and commodity programs are protected."

To join the Agriculture Committee, **Garamendi is required to resign from the House Natural Resources Committee**, which he did today. Committee appointments for the new 113th Congress have not been announced. Garamendi continues to serve on the House Armed Services Committee in the current Congress.

**From:** Tom Birmingham

**Sent:** Wednesday, November 28, 2012 2:48 PM

**To:** Nancy.Fox@mail.house.gov; James.Min@mail.house.gov

**CC:** 'Lombardi, Kyle'; 'Nelson, Damon'; 'Joseph T. Findaro'; 'Bernhardt, David L.'; 'Karen, Catherine'

**Subject:** Support Letter for California Water Provisions

**Attachments:** Ltr to Frelinghuysen re FY 13 Energy and Water Approps.pdf

Dear Ms. Fox and Mr. Min,

Attached is a letter of support related to the California water provisions offered by Senator Dianne Feinstein for the FY 13 Energy and Water appropriations bill. Thank you for your consideration of these comments.

Thomas Birmingham

General Manager



## Westlands Water District

3130 N. Fresno Street, P.O. Box 6056, Fresno, California 93703-6056, (559) 224-1523, FAX (559) 241-6277

November 28, 2012

The Hon. Rodney Frelinghuysen  
United States Representative  
2369 Rayburn HOB  
Washington DC 20515-3011

The Hon. Kevin McCarthy  
United States Representative  
326 Cannon HOB  
Washington DC 20515-0522

RE: California Water Provisions in FY13 Energy & Water Appropriations Bill

Dear Messrs. Frelinghuysen and McCarthy:

I am writing on behalf of Westlands Water District to express its support for the California water provisions that Senator Dianne Feinstein has proposed for the Fiscal Year 2013 Energy and Water Appropriations bill. These provisions would allow the Bureau of Reclamation to participate in groundwater banking projects, clarify and streamline the water transfers provisions of the Central Valley Project Improvement Act, allow Reclamation to provide drought planning assistance to Central Valley Project contractors, allow Reclamation to enter into agreements with joint powers authorities created under state law for surface storage studies, and require Reclamation to develop a plan to provide additional water deliveries to Central Valley Project contractors.

The actions authorized by these provisions are not a perfect solution to the chronic water supply shortages that have so adversely affected the people who live and work on the westside of the San Joaquin Valley in California. However, these provisions have the potential of providing real water supply improvements while we pursue long-term and more permanent legislative, administrative, and physical solutions to these chronic water supply shortages. In addition, Westlands is unaware of any opposition to these provisions. For the reasons described above, Westlands supports the provisions Senator Feinstein has offered for inclusion in the Fiscal Year 2013 Energy & Water Appropriations legislation.

Thank you for your continued efforts on this vitally important issue.

Very truly yours,

Thomas W. Birmingham  
General Manager

**From:** Bernhardt, David L.  
**Sent:** Wednesday, December 12, 2012 5:53 AM  
**To:** Thomas W. (Tom) Birmingham Esq.; Joseph T. Findaro  
**Subject:** Fwd: Salazar 'thinking hard' about second-term plans

FYI

**Subject: Salazar 'thinking hard' about second-term plans**

**Salazar 'thinking hard' about second-term plans**

**Phil Taylor, E&E reporter**

*Published: Wednesday, December 12, 2012*

Interior Secretary Ken Salazar last night said he has not decided whether he will return for President Obama's second term.

"We're thinking hard about it," he told reporters. "My family and I are having lots of great conversations."

His remarks, while brief, were some of his first since the November elections and will do nothing to tamp down speculation over whether he will continue to lead an agency that oversees energy development, recreation and conservation on hundreds of millions of acres of federal lands.

Salazar said he does not know when he will make a decision.

His comment, made after a speech at a women's history forum at the U.S. Capitol, contrasts with the account of at least one source who said Salazar last month told a group of 100 Interior employees that he was "staying for the foreseeable future."

"He in fact took out a piece of paper and wrote down that he would be there for the foreseeable future and signed it," said the source, who is close to Salazar. "It means he's not going anywhere soon."

Salazar is seen as a leading contender among members of President Obama's energy and environment team to remain in his post during a second term, though uncertainty remains.

U.S. EPA Administrator Lisa Jackson's future is surrounded by similar uncertainty ([Greenwire](#), Nov. 1). On the other hand, Energy Secretary Steven Chu is widely expected to depart now that the election is over ([Greenwire](#), Nov. 1).

Some observers have speculated that Salazar is considering returning to his home state of Colorado to spend more time with his wife and granddaughter, while others have said he could be eying a run for Colorado governor depending on current Gov. John Hickenlooper's (D) future plans.

Regardless, the department enters 2013 with many high-ranking vacancies, including unconfirmed assistant secretaries for lands and minerals and for fish, wildlife and parks, and director of the Bureau of Land Management ([Greenwire](#), Dec. 11).



**From:** Karen Clark

**Sent:** Wednesday, December 12, 2012 11:37 AM

**To:** 'Don Peracchi'; 'Alison MacLeod'; 'Carmela McHenry'; 'Carolyn Jensen'; 'Catherine Karen'; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Jason Peltier'; 'Joe Findaro'; 'Mike Burns'; 'Susan Ramos'; 'Tony Coelho'; Sarah Woolf; Don Peracchi; Dan Errotabere; Dan Errotabere; Don Peracchi; Sarah Woolf

**CC:** Karen Clark

**Subject:** Rescheduling In-Person PR/Legislation Strategy Meeting

Everyone,

Please let me know if you are available for an in-person meeting in Sacramento for the Strategy Meeting on the following dates:

January 10

January 14

January 21

January 23

January 28

January 29

January 30

January 31

Thanks!

*~Karen*

Karen Clark

Executive Assistant to Thomas W. Birmingham

Westlands Water District

P.O. Box 6056

Fresno, CA 93710

(c) [REDACTED]

(f) 559.241.6277

Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

---

**From:** Karen Clark [mailto:[kclark@westlandswater.org](mailto:kclark@westlandswater.org)]

**Sent:** Tuesday, December 11, 2012 5:39 PM

**To:** 'Don Peracchi'; 'Alison MacLeod'; 'Carmela McHenry'; 'Carolyn Jensen'; 'Catherine Karen'; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Jason Peltier'; 'Joe Findaro'; 'Mike Burns'; 'Susan Ramos'; 'Tony Coelho'; Sarah Woolf; Don Peracchi

**Cc:** Carolyn Jensen (cjensen@ka-pow.com)

**Subject:** Cancellation of December 17, 9:00 a.m. Meeting

**Importance:** High

Everyone,

I am sorry but we are going to have to postpone the December 17 meeting. Tom has been called as a witness in the SWRCB Fees litigation and his testimony has been scheduled for next Monday. We apologize for the inconvenience.

I will be in touch with you soon to reschedule the meeting after the first of the year.

Sincerely,

~Karen

Karen Clark

Executive Assistant to Thomas W. Birmingham

Westlands Water District

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(f) 559.241.6277

Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

---

**From:** Karen Clark [<mailto:kclark@westlandswater.org>]

**Sent:** Tuesday, November 20, 2012 10:49 AM

**To:** Don Peracchi; 'Alison MacLeod'; 'Carmela McHenry'; 'Carolyn Jensen'; Catherine Karen; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Jason Peltier'; 'Joe Findaro'; 'Mike Burns'; 'Susan Ramos'; 'Tony Coelho'

**Subject:** Change in Time/ December 17, 9:00 a.m. Meeting

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All,

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Thanks!

~Karen

Karen Clark

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Westlands Water District

P.O. Box 6056

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Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

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Karen Clark

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Westlands Water District

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Fresno, CA 93710

(c) [REDACTED]

(f) 559.241.6277

Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** joe.findaro@akerman.com  
**Sent:** Wednesday, December 12, 2012 11:39 AM  
**To:** kclark@westlandswater.org  
**Subject:** RE: Rescheduling In-Person PR/Legislation Strategy Meeting

jan 10

jan 14

jan 21 ( I would skip inauguration, but prefer not to if possible)

I will be in Dubai/Africa January 22 – 31.

THANKS

[V Card](#) | [Bio](#) | [akerman.com](#)



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CIRCULAR 230 NOTICE: To comply with U.S. Treasury Department and IRS regulations, we are required to advise you that, unless expressly stated otherwise, any U.S. federal tax advice contained in this transmittal, is not intended or written to be used, and cannot be used, by any person for the purpose of (i) avoiding penalties under the U.S. Internal Revenue Code, or (ii) promoting, marketing or recommending to another party any transaction or matter addressed in this e-mail or attachment.

---

**From:** Karen Clark [mailto:kclark@westlandswater.org]  
**Sent:** Wednesday, December 12, 2012 1:37 PM  
**To:** 'Don Peracchi'; 'Alison MacLeod'; 'Carmela McHenry'; 'Carolyn Jensen'; 'Catherine Karen'; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Jason Peltier'; Findaro, Joe (OC-DC); 'Mike Burns'; 'Susan Ramos'; 'Tony Coelho'; Sarah Woolf; Don Peracchi; Dan Errotabere; Dan Errotabere; Don Peracchi; Sarah Woolf  
**Cc:** Karen Clark  
**Subject:** Rescheduling In-Person PR/Legislation Strategy Meeting

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Thanks!

*~Karen*

Karen Clark

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Westlands Water District

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(f) 559.241.6277

Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

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Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

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**From:** Karen Clark [<mailto:kclark@westlandswater.org>]

**Sent:** Tuesday, November 20, 2012 10:49 AM

**To:** Don Peracchi; 'Alison MacLeod'; 'Carmela McHenry'; 'Carolyn Jensen'; Catherine Karen; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Jason Peltier'; 'Joe Findaro'; 'Mike Burns'; 'Susan Ramos'; 'Tony Coelho'

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(c) [REDACTED]

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Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Jason Peltier  
**Sent:** Wednesday, December 12, 2012 11:57 AM  
**To:** Karen Clark  
**Subject:** Re: Rescheduling In-Person PR/Legislation Strategy Meeting

Below....

On Dec 12, 2012, at 10:36 AM, "Karen Clark" <[kclark@westlandswater.org](mailto:kclark@westlandswater.org)> wrote:

Everyone,

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January 14. OK

January 21. OK

January 23. NO

January 28 OK

January 29 OK

January 30 OK

January 31 OK

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Westlands Water District  
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**Cc:** Carolyn Jensen ([cjensen@ka-pow.com](mailto:cjensen@ka-pow.com))  
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Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

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**Sent:** Tuesday, November 20, 2012 10:49 AM  
**To:** Don Peracchi; 'Alison MacLeod'; 'Carmela McHenry'; 'Carolyn Jensen'; Catherine Karen; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Jason Peltier'; 'Joe Findaro'; 'Mike Burns'; 'Susan Ramos'; 'Tony Coelho'  
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Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Bernhardt, David L.  
**Sent:** Wednesday, December 12, 2012 12:04 PM  
**To:** 'Karen Clark'  
**Subject:** RE: Rescheduling In-Person PR/Legislation Strategy Meeting

The 10<sup>th</sup> is difficult, I can make the other dates work.

---

**From:** Karen Clark [mailto:kclark@westlandswater.org]  
**Sent:** Wednesday, December 12, 2012 1:37 PM  
**To:** 'Don Peracchi'; 'Alison MacLeod'; 'Carmela McHenry'; 'Carolyn Jensen'; 'Catherine Karen'; Bernhardt, David L.; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Jason Peltier'; 'Joe Findaro'; 'Mike Burns'; 'Susan Ramos'; 'Tony Coelho'; Sarah Woolf; Don Peracchi; Dan Errotabere; Dan Errotabere; Don Peracchi; Sarah Woolf  
**Cc:** Karen Clark  
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Woolf; Don Peracchi

**Cc:** Carolyn Jensen ([cjensen@ka-pow.com](mailto:cjensen@ka-pow.com))

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~Karen

Karen Clark

Executive Assistant to Thomas W. Birmingham

Westlands Water District

P.O. Box 6056

Fresno, CA 93710

(c) [REDACTED]

(f) 559.241.6277

Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

---

**From:** Karen Clark [<mailto:kclark@westlandswater.org>]

**Sent:** Tuesday, November 20, 2012 10:49 AM

**To:** Don Peracchi; 'Alison MacLeod'; 'Carmela McHenry'; 'Carolyn Jensen'; Catherine Karen; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Jason Peltier'; 'Joe Findaro'; 'Mike Burns'; 'Susan Ramos'; 'Tony Coelho'

**Subject:** Change in Time/ December 17, 9:00 a.m. Meeting

**Importance:** High

All,

Sorry for the confusion. This meeting will be held at **9:00 a.m.** after all. Please update your calendars.

Thanks!

~Karen

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**Subject:** December 17, 8:00 a.m. Meeting

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If you have any questions, please contact me.

Sincerely,

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Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Gayle Holman  
**Sent:** Wednesday, December 12, 2012 12:10 PM  
**To:** 'Karen Clark'  
**Subject:** RE: Rescheduling In-Person PR/Legislation Strategy Meeting

Hi Karen:

I can make any of those dates work—even Monday, January 21<sup>st</sup> which is Martin Luther King's federal holiday.

Gayle

**Gayle Holman**  
**Public Affairs Representative**  
**Westlands Water District**  
**3130 N. Fresno Street**  
**P.O. Box 6056**  
**Fresno, CA 93703-6056**  
**(559) 241-6233 (direct)**  
**(559) [REDACTED] (cell)**  
**(559) 241-6277 (fax)**  
**[gholman@westlandswater.org](mailto:gholman@westlandswater.org)**

---

**From:** Karen Clark [mailto:kclark@westlandswater.org]  
**Sent:** Wednesday, December 12, 2012 10:37 AM  
**To:** 'Don Peracchi'; 'Alison MacLeod'; 'Carmela McHenry'; 'Carolyn Jensen'; 'Catherine Karen'; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Jason Peltier'; 'Joe Findaro'; 'Mike Burns'; 'Susan Ramos'; 'Tony Coelho'; Sarah Woolf; Don Peracchi  
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**Subject:** Rescheduling In-Person PR/Legislation Strategy Meeting

Everyone,

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January 23

January 28

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January 30

January 31

Thanks!

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**Cc:** Carolyn Jensen ([cjensen@ka-pow.com](mailto:cjensen@ka-pow.com))

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Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Christy Christensen  
**Sent:** Wednesday, December 12, 2012 12:38 PM  
**To:** 'kclark@westlandswater.org'  
**Subject:** FW: Rescheduling In-Person PR/Legislation Strategy Meeting

Good Morning Karen –  
I am Doug's assistant. He is available on the following days:

Jan 10 – open all day  
Jan 14 – open 8-2  
Jan 21 – not available  
Jan 23 – open all day  
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Jan 29 – open 10-1  
Jan 30 – open all day  
Jan 31 – open 8-3

Also, Carmela is out this week, and I am assisting Carolyn for her. I have an email into Carolyn about this meeting. I am not sure when she plans to be in Sacramento. I will keep you posted.

Thank you

*Christy Christensen*  
**KP PUBLIC AFFAIRS**

1201 K Street, Suite 800, Sacramento, CA 95814  
p. 916.448.2162 d. 916.498.7760 f. 916.448.4923  
w. [www.ka-pow.com](http://www.ka-pow.com) e. [cchristensen@ka-pow.com](mailto:cchristensen@ka-pow.com)

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**To:** Christy Christensen  
**Subject:** FW: Rescheduling In-Person PR/Legislation Strategy Meeting

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**Sent:** Wednesday, December 12, 2012 10:38 AM  
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Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Christy Christensen  
**Sent:** Wednesday, December 12, 2012 12:44 PM  
**To:** 'kclark@westlandswater.org'  
**Subject:** RE: Rescheduling In-Person PR/Legislation Strategy Meeting

I just heard back from Carolyn. She is available on the following days –

- I can do 14<sup>th</sup>, 23<sup>rd</sup>, 28<sup>th</sup>, 29<sup>th</sup>, 30<sup>th</sup>, 31<sup>st</sup>.
- I can make the 10<sup>th</sup> work if necessary.

Thank you

*Christy Christensen*  
**KP PUBLIC AFFAIRS**

1201 K Street, Suite 800, Sacramento, CA 95814  
p. 916.448.2162 d. 916.498.7760 f. 916.448.4923  
w. [www.ka-pow.com](http://www.ka-pow.com) e. [cchristensen@ka-pow.com](mailto:cchristensen@ka-pow.com)

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Also, Carmela is out this week, and I am assisting Carolyn for her. I have an email into Carolyn about this meeting. I am not sure when she plans to be in Sacramento. I will keep you posted.

Thank you

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**From:** Julie Reynolds  
**Sent:** Wednesday, December 12, 2012 1:19 PM  
**To:** Karen Clark (kclark@westlandswater.org)  
**Subject:** FW: Rescheduling In-Person PR/Legislation Strategy Meeting

Hi Karen:

I am responding on Mike's and Ed's behalf (Carmela is on vacation). Christy Christensen will respond to you on behalf of Carolyn and Doug. Do you need a 3 hour block of time?

---

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**Sent:** Wednesday, December 12, 2012 10:36:34 AM (UTC-08:00) Pacific Time (US & Canada)  
**To:** 'Don Peracchi'; Alison MacLeod; Carmela McHenry; Carolyn Jensen; 'Catherine Karen'; 'David Bernhardt'; Doug Subers; Ed Manning; 'Gayle Holman'; 'Jason Peltier'; 'Joe Findaro'; Michael Burns; 'Susan Ramos'; 'Tony Coelho'; Sarah Woolf; Don Peracchi; Dan Errotabere; Dan Errotabere; Don Peracchi; Sarah Woolf  
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January 23-- MIKE AND ED ARE AVAILABLE

January 28—THIS DAY DOES NOT WORK

January 29-- MIKE AND ED ARE AVAILABLE

January 30-- MIKE AND ED ARE AVAILABLE

January 31-- MIKE AND ED ARE AVAILABLE

Thanks!

~Karen

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Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Daniel Errotabere

**Sent:** Wednesday, December 12, 2012 3:02 PM

**To:** 'Karen Clark'; 'Don Peracchi'; 'Alison MacLeod'; 'Carmela McHenry'; 'Carolyn Jensen'; 'Catherine Karen'; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Jason Peltier'; 'Joe Findaro'; 'Mike Burns'; 'Susan Ramos'; 'Tony Coelho'; 'Sarah Woolf'; 'Don Peracchi'; 'Don Peracchi'; 'Sarah Woolf'

**Subject:** RE: Rescheduling In-Person PR/Legislation Strategy Meeting

Karen:

I am good for the 14<sup>th</sup>, 28<sup>th</sup>, 29<sup>th</sup>, 30<sup>th</sup> & 31<sup>st</sup>.

Dan

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**Subject:** Rescheduling In-Person PR/Legislation Strategy Meeting

Everyone,

Please let me know if you are available for an in-person meeting in Sacramento for the Strategy Meeting on the following dates:

January 10

January 14

January 21

January 23

January 28

January 29

January 30

January 31

Thanks!

~Karen

Karen Clark

Executive Assistant to Thomas W. Birmingham

Westlands Water District

P.O. Box 6056

Fresno, CA 93710

(c) [REDACTED]

(f) 559.241.6277

Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

---

**From:** Karen Clark [<mailto:kclark@westlandswater.org>]

**Sent:** Tuesday, December 11, 2012 5:39 PM

**To:** 'Don Peracchi'; 'Alison MacLeod'; 'Carmela McHenry'; 'Carolyn Jensen'; 'Catherine Karen'; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Jason Peltier'; 'Joe Findaro'; 'Mike Burns'; 'Susan Ramos'; 'Tony Coelho'; Sarah Woolf; Don Peracchi

**Cc:** Carolyn Jensen ([cjensen@ka-pow.com](mailto:cjensen@ka-pow.com))

**Subject:** Cancellation of December 17, 9:00 a.m. Meeting

**Importance:** High

Everyone,

I am sorry but we are going to have to postpone the December 17 meeting. Tom has been called as a witness in the SWRCB Fees litigation and his testimony has been scheduled for next Monday. We apologize for the inconvenience.

I will be in touch with you soon to reschedule the meeting after the first of the year.

Sincerely,

*~Karen*

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Executive Assistant to Thomas W. Birmingham

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Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

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**Subject:** Change in Time/ December 17, 9:00 a.m. Meeting

**Importance:** High

All,

Sorry for the confusion. This meeting will be held at **9:00 a.m.** after all. Please update your calendars.

Thanks!

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Karen Clark

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Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Tony Coelho  
**Sent:** Wednesday, December 12, 2012 3:50 PM  
**To:** Karen Clark  
**Subject:** Re: Rescheduling In-Person PR/Legislation Strategy Meeting

See comments below!

Tony

On Dec 12, 2012, at 1:36 PM, Karen Clark <[kclark@westlandswater.org](mailto:kclark@westlandswater.org)> wrote:

Everyone,

Please let me know if you are available for an in-person meeting in Sacramento for the Strategy Meeting on the following dates:

January 10 - NO

January 14 - Excellent

January 21 - No

January 23 - No

January 28 - OK

January 29 - OK

January 30 - OK

January 31 - OK

Thanks!

*~Karen*

Karen Clark  
Executive Assistant to Thomas W. Birmingham  
Westlands Water District  
P.O. Box 6056  
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Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Carmela McHenry  
**Sent:** Wednesday, December 12, 2012 6:06 PM  
**To:** Karen Clark (kclark@westlandswater.org)  
**Subject:** FW: Rescheduling In-Person PR/Legislation Strategy Meeting

Hi Karen:

Sorry for the delay. I am out of the office this week, on vacation, with limited access to my emails.

At your request --- Below works for Ed, Carolyn, Alison and Mike to reschedule the In-person PR/Leg meeting at KP. If you have any questions, please contact Julie Reynolds (Mike's assistant) at 916-448-2162 OR we can touch base when I am back in the office on Monday, Jan. 17<sup>th</sup>. Thanks and have a great night!

Jan. 14<sup>th</sup> – any time between 10 AM to 4 PM  
Jan. 29<sup>th</sup> – between 1 PM to 4 PM  
Jan. 30<sup>th</sup> – between 11 AM to 4 PM  
Jan. 31<sup>st</sup> - any time between 10 AM to 4 PM

---

**From:** Daniel Errotabere [mailto:daniele@errotabereranches.com]  
**Sent:** Wednesday, December 12, 2012 2:02 PM  
**To:** 'Karen Clark'; 'Don Peracchi'; Alison MacLeod; Carmela McHenry; Carolyn Jensen; 'Catherine Karen'; 'David Bernhardt'; Doug Subers; Ed Manning; 'Gayle Holman'; 'Jason Peltier'; 'Joe Findaro'; Michael Burns; 'Susan Ramos'; 'Tony Coelho'; 'Sarah Woolf'; 'Don Peracchi'; 'Don Peracchi'; 'Sarah Woolf'  
**Subject:** RE: Rescheduling In-Person PR/Legislation Strategy Meeting

Karen:  
I am good for the 14<sup>th</sup>, 28<sup>th</sup>, 29<sup>th</sup>, 30<sup>th</sup> & 31<sup>st</sup>.  
Dan

---

**From:** Karen Clark [mailto:kclark@westlandswater.org]  
**Sent:** 12 12, 2012 10:37 AM  
**To:** 'Don Peracchi'; 'Alison MacLeod'; 'Carmela McHenry'; 'Carolyn Jensen'; 'Catherine Karen'; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Jason Peltier'; 'Joe Findaro'; 'Mike Burns'; 'Susan Ramos'; 'Tony Coelho'; Sarah Woolf; Don Peracchi; Dan Errotabere; Dan Errotabere; Don Peracchi; Sarah Woolf  
**Cc:** Karen Clark  
**Subject:** Rescheduling In-Person PR/Legislation Strategy Meeting

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All,

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Thanks!

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**From:** Karen Clark  
**Sent:** Thursday, December 13, 2012 12:06 PM  
**To:** 'Susan Ramos'  
**Subject:** RE: Rescheduling In-Person PR/Legislation Strategy Meeting

DWR is just now kicking you off? I'm surprised they let you stay on this long.

*~Karen*

Karen Clark  
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---

**From:** Susan Ramos [mailto:[sramos@westlandswater.org](mailto:sramos@westlandswater.org)]  
**Sent:** Wednesday, December 12, 2012 1:58 PM  
**To:** Karen Clark  
**Subject:** Re: Rescheduling In-Person PR/Legislation Strategy Meeting

Karen

I can make all those times - any chance for a reprieve from Bonderson is like a free pass day, I need to drive down to Fresno in the next couple of days do Jim can upgrade my computer they are kicking me off the DWR email - can you believe it?!

Sue

On Dec 12, 2012, at 10:36 AM, "Karen Clark" <[kclark@westlandswater.org](mailto:kclark@westlandswater.org)> wrote:

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Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

**From:** Sarah Clark Woolf

**Sent:** Friday, December 14, 2012 8:41 AM

**To:** Karen Clark; 'Don Peracchi'; 'Alison MacLeod'; 'Carmela McHenry'; 'Carolyn Jensen'; 'Catherine Karen'; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Jason Peltier'; 'Joe Findaro'; 'Mike Burns'; 'Susan Ramos'; 'Tony Coelho'; Dan Errotabere

**CC:** Karen Clark

**Subject:** Re: Rescheduling In-Person PR/Legislation Strategy Meeting

I am available all days but Jan 10

---

**From:** Karen Clark [mailto:kclark@westlandswater.org]

**To:** 'Don Peracchi' [mailto:dperacchi@westlandswater.org], 'Alison MacLeod' [mailto:amacleod@ka-pow.com], 'Carmela McHenry' [mailto:cmchenry@ka-pow.com], 'Carolyn Jensen' [mailto:cjensen@ka-pow.com], 'Catherine Karen' [mailto:ckaren@sidley.com], 'David Bernhardt' [mailto:dbernhardt@BHFS.com], 'Doug Subers' [mailto:dsubers@ka-pow.com], 'Ed Manning' [mailto:emanning@ka-pow.com], 'Gayle Holman' [mailto:gholman@westlandswater.org], 'Jason Peltier' [mailto:jpeltier@westlandswater.org], 'Joe Findaro' [mailto:joe.findaro@akerman.com], 'Mike Burns' [mailto:mburns@ka-pow.com], 'Susan Ramos' [mailto:sramos@westlandswater.org], 'Tony Coelho' [mailto:tony@onewharf.com], Sarah Woolf [mailto:swoolf@westlandswater.org], Don Peracchi [mailto:dperacchi@westlandswater.org], Dan Errotabere [mailto:daniele@errotabereranches.com], Dan Errotabere [mailto:daniele@errotabereranches.com], Don Peracchi [mailto:dperacchi@westlandswater.org], Sarah Woolf [mailto:swoolf@westlandswater.org]

**Cc:** Karen Clark [mailto:kclark@westlandswater.org]

**Sent:** Wed, 12 Dec 2012 10:36:34 -0800

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Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)



**From:** Karen Clark

**Sent:** Sunday, December 16, 2012 4:36 PM

**To:** 'Don Peracchi'; 'Alison MacLeod'; 'Carmela McHenry'; 'Carolyn Jensen'; 'Catherine Karen'; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Jason Peltier'; 'Joe Findaro'; 'Mike Burns'; 'Susan Ramos'; 'Tony Coelho'; Sarah Woolf; Don Peracchi; Dan Errotabere; Dan Errotabere; Don Peracchi; Sarah Woolf; Karen Clark

**Subject:** In-Person PR/Legislation Strategy Meeting

Everyone,

I have scheduled this meeting for Monday, January 14, 2013 at 10:00 a.m. at KP Communications.

If you have any questions, please feel free to contact me.

Sincerely,

~Karen

Karen Clark

Executive Assistant to Thomas W. Birmingham

Westlands Water District

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**Subject:** Re: In-Person PR/Legislation Strategy Meeting

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**Subject:** RE: In-Person PR/Legislation Strategy Meeting

# Latinos' approval a political imperative

## POLITICS

**Joe Garofoli**

**Updated 8:43 am, Monday, December 17, 2012**

A record 31 Latinos will take their seats in Congress next year, with California sending nine, the most of any state.

But analysts say that is not the most significant number to come out of the November election. Latino political power changed, as one activist put it, "from potential to real" in the form of a record 10 percent of the electorate.

Post-election, Latino leaders are taking on two bigger challenges: getting politicians to listen to the people who put them in office and keeping those Latino voters engaged after the excitement of the presidential campaign has faded.

In the coming weeks, eight national organizations that coaxed a record 12.5 million Latino voters to the polls will unite behind an effort to track legislators' votes on immigration issues, including the big prize: making it easier for illegal immigrants to become citizens. They hope their voting scorecard will pressure politicians of both parties to carefully consider the power of the Latino vote.

Even though Latinos voted 71 percent for President [Obama](#), experts say it is possible for either party to capture the loyalty of the growing bloc of young Latino voters.

## A youthful majority

More than half of Californians under 18 are Latino, said state Sen. [Alex Padilla](#), D-Los Angeles, president of the board of the [National Association of Latino Elected](#) and Appointed Officials, which is one of the organizations involved in tracking Congressional votes on immigration. In Texas, 48 percent are under 18, he said.

"In 10 years, will those people be Democrats or [Republicans](#)? Will California or Texas be a red state or a blue state? We don't know. It depends on how the parties treat Latino voters," Padilla said.

## 2014 outweighs 2012

What happens in 2014 to the lawmakers who don't support immigration reform will likely say more about Latino political power than the record number going to Congress in the new year.

"Before, people may not have cared what that score was, but I think going into the future people will care a lot about the score that they receive on that scorecard," said [Janet Murguia](#), president of the [National Council of La Raza](#), one of the national organizations that will keep district-by-district tallies of how their members of Congress vote.

Organizations like Murguia's and the voter registration and engagement group Voto Latino are working with major Obama donors to lobby Congress on immigration issues starting this spring. They want immigration laws that include a pathway to citizenship, and they don't want a series of piecemeal changes, as some Republicans have proposed.

A sizable chunk of the money is expected to come from Hollywood. One of the fundraising leaders is actress [Eva Longoria](#), who appeared on behalf of Obama during the campaign. Insiders say they are still pulling together and shaping their message as they try to connect with organizations outside the Latino political world.

"Some LGBT organizations would be a natural fit because a lot of the people who oppose immigration reform are the same people who oppose same-sex marriage," said [Brandon Hernandez](#), a San Francisco resident and vice chairman of Voto Latino.

For years, demographers foretold a ballooning Latino population. November's election showed how Latinos can be a game-changer by voting in significant numbers. Their lopsided support of Obama was key to his victory.

Analysts say Washington should listen, as the Latino share of the electorate is projected to go nowhere but up.

While the nation's 53 million Latinos were just 10 percent of all voters in 2012, the nonpartisan [Pew Hispanic Center](#) projects that Latinos will account for 40 percent of the growth in the eligible electorate in the United States by 2030, when 40 million will be eligible to vote.

## It's stance that counts

Yet Latinos aren't reflexively voting Democratic, said [Matt Barreto](#), a political science professor at the [University](#) of Washington and co-founder of Latino Decisions, which polled Latino voters extensively in 2012.

An [Impre Media/Latino Decisions](#) poll found that 36 percent of Latinos said they voted not because they liked Obama or disliked Republican nominee [Mitt Romney](#) but because they wanted to "support Latinos."

"If we go six months without immigration reform, you're going to see Latino voters who are not part of any of those organizations like National Council of La Raza getting very active," Barreto said.

Since the election, many conservatives have called for the Republicans to improve their relationship with the fast-growing Latino community.

But many Latinos, surveys have said, are turned off by the party's opposition to efforts to make it easier for undocumented immigrants to become U.S. citizens as well as the harsh rhetoric used by some conservatives during the campaign.

[Richard Land](#), a white evangelical Christian and president of the [Southern Baptist Convention's Ethics and Religious Liberty Commission](#), said the GOP began to lose the 2012 presidential race on Sept. 12, 2011. That's when a conservative primary debate audience booed Texas Gov. [Rick Perry](#) when he defended a decision to give in-state tuition to the children of undocumented immigrants.

Embracing immigration issues might start to redeem the GOP in the eyes of Latino voters.

"The [Republican Party](#) can make an important first step in addressing this issue," said National Council of La Raza's Murguia. "It's hard for Hispanics to really engage and listen to Republicans talk about other issues when they sense they are not open to immigration reform. It just creates a real barrier to engaging the entire Latino community."

*Joe Garofoli is a [San Francisco Chronicle](#) staff writer. E-mail: [jgarofoli@sfchronicle.com](mailto:jgarofoli@sfchronicle.com) Twitter: [@joegarofoli](#)*

Read more: <http://www.sfgate.com/politics/joegarofoli/article/Latinos-approval-a-political-imperative-4122934.php#ixzz2FKaskZv6>

**From:** Karen, Catherine  
**Sent:** Monday, December 17, 2012 11:31 AM  
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Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

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**From:** Karen Clark [<mailto:kclark@westlandswater.org>]  
**Sent:** Tuesday, December 11, 2012 5:39 PM  
**To:** 'Don Peracchi'; 'Alison MacLeod'; 'Carmela McHenry'; 'Carolyn Jensen'; 'Catherine Karen'; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Jason Peltier'; 'Joe Findaro'; 'Mike Burns'; 'Susan Ramos'; 'Tony Coelho'; Sarah Woolf; Don Peracchi  
**Cc:** Carolyn Jensen ([cjensen@ka-pow.com](mailto:cjensen@ka-pow.com))  
**Subject:** Cancellation of December 17, 9:00 a.m. Meeting  
**Importance:** High

Everyone,

I am sorry but we are going to have to postpone the December 17 meeting. Tom has been called as a witness in the SWRCB Fees litigation and his testimony has been scheduled for next Monday. We apologize for the inconvenience.

I will be in touch with you soon to reschedule the meeting after the first of the year.

Sincerely,

*~Karen*

Karen Clark  
Executive Assistant to Thomas W. Birmingham  
Westlands Water District  
P.O. Box 6056  
Fresno, CA 93710  
(c) [REDACTED]  
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Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

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**From:** Karen Clark [<mailto:kclark@westlandswater.org>]  
**Sent:** Tuesday, November 20, 2012 10:49 AM  
**To:** Don Peracchi; 'Alison MacLeod'; 'Carmela McHenry'; 'Carolyn Jensen'; Catherine Karen; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Jason Peltier'; 'Joe Findaro'; 'Mike Burns'; 'Susan Ramos'; 'Tony Coelho'

**Subject:** Change in Time/ December 17, 9:00 a.m. Meeting

**Importance:** High

All,

Sorry for the confusion. This meeting will be held at **9:00 a.m.** after all. Please update your calendars.

Thanks!

*~Karen*

Karen Clark

Executive Assistant to Thomas W. Birmingham

Westlands Water District

P.O. Box 6056

Fresno, CA 93710

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Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

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**From:** Karen Clark [<mailto:kclark@westlandswater.org>]

**Sent:** Tuesday, November 20, 2012 9:56 AM

**To:** Don Peracchi; 'Alison MacLeod'; 'Carmela McHenry'; 'Carolyn Jensen'; Catherine Karen; 'David Bernhardt'; 'Doug Subers'; 'Ed Manning'; 'Gayle Holman'; 'Jason Peltier'; 'Joe Findaro'; 'Mike Burns'; 'Susan Ramos'; 'Tony Coelho'

**Subject:** December 17, 8:00 a.m. Meeting

All,

This is to confirm that there will be an in-person PR/Legislation Meeting on December 17 at **8:00 a.m.** (not 9:00 a.m. as previously stated) in Sacramento at KP Communications, 1201 K Street, Suite 800.

If you have any questions, please contact me.

Sincerely,

*~Karen*

Karen Clark

Executive Assistant to Thomas W. Birmingham

Westlands Water District

P.O. Box 6056

Fresno, CA 93710

(c) [REDACTED]

(f) 559.241.6277

Email: [kclark@westlandswater.org](mailto:kclark@westlandswater.org)

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**From:** Bernhardt, David L.  
**Sent:** Wednesday, December 26, 2012 4:38 PM  
**To:** Tom Birmingham  
**Subject:** Re: Friday's Conference Call

Thanks Tom.

David Bernhardt  


On Dec 26, 2012, at 5:49 PM, "Tom Birmingham" <[tbirmingham@westlandswater.org](mailto:tbirmingham@westlandswater.org)> wrote:

Given people's holiday travels, this week's conference call is cancelled. Please forward this message to anyone in your organization who normally participates and who I have omitted from the distribution.

Thank you, and Happy New Year.

Tom